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News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

VOLUME 30 WEDNESDAY, OCTOBER 5, 1938 NUMBER 40

Texas Settles Allred's Suit After 7 Years

By Telegraph

AUSTIN, TEXAS, Oct. 4. — The seven-year-old suit of the state of Texas against 15 oil companies and two trade associations ended today. Judgment was entered by Judge J. D. Moore, in Travis County district court, at Austin, finding all defendants not guilty except the Texas Petroleum Marketers Assn. That organization, which has existed in name only for more than five years, was fined $450,000 and court costs, which amount to about $2500.

Settlement came through the urging of the court. The case was called for trial yesterday and after defense attorneys had urged continuance, Judge Moore suggested counsel for state and for the defendants to try to effect a compromise that would save expense and time involved in a trial. It had been predicted by the state that trial would require 60 to 90 days.

The suit was started in late 1931 when Governor James V. Allred was attorney general. It charged conspiracy to violate the anti-trust laws of Texas, through operation of the voluntary code of fair practices drafted under the auspices of the American Petroleum Institute.

Case Dropped Once

In 1934, the same judge before whom the case went to trial Monday, sustained a defense demurrer and threw out the case, holding that the NRA petroleum code had superseded the other code and had in effect suspended the anti-trust laws of Texas in this respect.

The state appealed to the Court of Civil Appeals, which affirmed the judgment of the lower court but for a different reason. Its holding was that the anti-trust laws of the state were unconstitutional. Early this year the state supreme court reinstated the case.

In urging Monday that settlement be made, Judge Moore said it was a matter of common knowledge that the code which formed basis of the suit no longer exists and that the practices complained of had ceased.

Defendants in the original suit were Standard Oil Co. of New

(*Continued on page* 16)

More Refiners Buy Oil on Their Terms

By Teletype
N. P. N. News Bureau

TULSA, Oct. 4. — Another arrangement by which a Mid-Continent refiner plans to charge back transportation on part of its crude requirements, and the cessation of purchases Oct. 15 by Barnsdall Oil Co. in the eastern part of Osage county, in Oklahoma, ushered in a week in which the crude situation continues unsettled.

The first mentioned development has not been announced publicly nor are the details known. However, it is one step some refiners have already adopted to overcome their operating losses, based on the present posted price of crude, by passing the transportation charges back to the producer, which brings the price he receives somewhat under the posted price.

Except for the reduction Sept.

(*Continued on page* 13)

WPA Workers Probe Oil In Pennsylvania

By Telegraph

HARRISBURG, Pa., Oct. 4.— As members of Pennsylvania's oil industry investigation commission today awaited confirmation by the Senate of their reappointment, it became known that their probe has been going forward all this year despite the fact it was declared unconstitutional early in July by the state supreme court.

The supreme court action came after a Dauphin county (Harrisburg) court had granted a temporary injunction late in January, (making it permanent in April) against the commission. Since that time the investigation has had no legal standing, but, provided with funds through the Works Progress Administration (WPA) at Washington of the federal government, the work has gone ahead.

WPA funds totaling $125,000, were granted from Washington in October and December last year for WPA projects "to provide employment for unemployed professional, educational and clerical workers" in assembling and analyzing data on the "production, refining, marketing and trade practices of the petroleum industry in Pennsylvania." Application for the project came from the commission, which then had legal standing. Chairman Ralph H. Smith, of Pittsburgh, made several trips to Washington to arrange for the project.

Report Drafted

Meanwhile, it has been learned that the commission by the aid of the WPA money ($52,288 of which had been spent through Aug. 4, according to WPA records here) has drafted a tentative report, which will be whipped into shape in time to recommend regulatory legislation for the oil industry at the next regular session of the legislature in January.

These plans, of course, are based on the assumption that the appointment of the members will be confirmed by the senate, now sitting two days a week in a special session.

However, if the membership is not confirmed, as reappointed by Gov. Earle, under authority of a special law passed by the current special session, senator E. J. Thompson, of Centre county, a member of the commission, will seek passage of a bill he introduced today to change the commission so that membership would come entirely from the state legislature, hence not subject to senate confirmation.

The commission, appointed early last year and reappointed this year, was made up of Thompson, Judge Smith, Rep. M. C. Chervenak of Cambria County, John E. McComb, independent producer from the oil districts, and William S. Godfrey, Philadelphia independent marketer.

Thompson's bill will not be pushed, it was said, until after an attempt has been made to have the old membership of the

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CHICAGO — Justice department seeks to mandamus Judge Stone to rescind Madison dismissals. Page 6.

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NEW YORK—Circuit court reverses $2,000,000 damage award in Jenkins-Sinclair suit. Page 15.

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WASHINGTON — Stored crude found as good as today's by Bureau of Mines. Page 17.

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TULSA—Drilled oil reserves reach all-time peak, Geologist McCoy reports to Gov. Marland. Page 16.

committee confirmed by the senate.

The way is being cleared for resumption of the inquiry, by whatever group is named to carry it on. The senate yesterday passed a House-approved bill ratifying the expenditures of the commission still unpaid at the time it was outlawed, and the bill providing for renewing the inquiry. It also provided that unused portions of the $50,000 which was originally given for the oil investigation be passed along to the new committee. In addition, a further appropriation of $20,000 has been made for the committee's use.

The WPA oil-investigation project, state-wide in scope, was started on its way late in October last year, with no fanfare of publicity. One of its first jobs was to go through state finance and revenue department files in Harrisburg to get a record of every service station in the state. These records were tabulated by the workers according to the counties. From this data, workers went to every county courthouse in the state and assembled data as to assessed valuation of every piece of oil industry property—from refineries and wells to service stations and one-pump garages.

Another part of the WPA work was mailing out 28,338 questionnaires to every retail outlet in the state, and the "editing, transcribing and tabulating" of the 6782 which were returned. Just what point in this work had been reached when the oil commission was outlawed by the court cannot be determined from WPA files, because the work went ahead without benefit of the commission.

The continuance of the work despite loss of the commission as "sponsor" was accomplished through a neat bit of horse-changing in mid-stream.

WPA officials said that, when the oil commission lost its entity, they personally cast about for a new sponsor for the work, which at that time was employing over 100 of the unemployed statisticians, and other white-collar workers for which it was created.

They lit upon the state treasurer's department, explaining to NATIONAL PETROLEUM NEWS today that they thought the information being gathered and analyzed by the WPA workers would be of "great value" to the fiscal departments of the state.

Somewhere near 100 WPA workers still are engaged on the project, and state WPA officials, anticipating continuance of the probe in one form or another, are getting ready to ask Washington for more money to add to the $125,000 already allotted.

As of August 4, latest date for which a "project report" is available, the project had provided 74,798 man-hours of work for the WPA workers, etc., and, it is assumed, volumes of information for the committee which is yet to be established. Pay of workers ranges from $71.50 to $94 per month, depending upon classification.

Assuming that the inquiry will be revived in one form or another, Reed O. Burford, state co-ordinator of statistical WPA projects, told NATIONAL PETROLEUM NEWS today he will confer with Judge Smith this week to lay out plans for continuation of the WPA project.

These will include, it is expected, sending out the questionnaires to other branches of the industry, and the tabulation of returns when they begin coming in. It is also expected that subpoenas will be issued to require return of the 22,000 service station questionnaires not yet returned. Hence the need for more money.

Kentucky Jobbers Meet Feb. 7-8

LOUISVILLE, Oct. 4. — The 13th annual meeting of the Kentucky Petroleum Marketers Assn. will be held Feb. 7 and 8 at the Brown Hotel, Louisville. There will also be a trade exhibit.

Justice Department Asks Circuit Court To Mandamus Stone

N. P. N. News Bureau

CHICAGO, Oct. 3.—Justice department today filed a petition in federal circuit court here asking for a mandamus against Federal Judge Stone to compel him to rescind his order of July 19 dismissing 11 defendants in the first Madison oil case. Judge Stone on Sept. 22 had denied the government's petition for rescission of his order (See N.P.N., Sept. 28).

Circuit Judge Evans has set Oct. 24 for argument on a "show cause" order on the mandamus petition.

In government's petition to Judge Evans, same arguments against Judge Stone's dismissal order were made as in the hearing Aug. 4 at Madison (See N.P.N., Aug. 10).

Government disclosed that it plans to bring the 11 defendants (whose dismissal was attacked) to trial along with the other Madison defendants granted new trials. Trials will be before Federal District Judge Lindley, of Danville, Ill. Hearing will be held by Judge Lindley at Madison on Oct. 14 to decide on a trial date.

ICC Denies Petition To Postpone Hearing On Private Truckers

By Teletype
N. P. N. News Bureau

WASHINGTON, Oct. 4. — Interstate Commerce Commission today denied the petition of the American Petroleum Institute asking that private trucks be omitted from the October hearings on proposed safety regulations for trucks hauling "dangerous" articles, including gasoline and certain other petroleum products.

The A. P. I. had asked that the question of whether these regulations should be private trucks (as well as for-hire truckers) be put off and considered by the ICC in connection with its study of the need for safety regulations for all private carriers.

First hearing on the proposed regulations will be at Los Angeles, Oct. 10; then at Tulsa, Oct. 17; and Washington, Oct. 26.

Inclusion of private carriers in the coming hearings was regarded by some authorities as the "entering wedge" for regulation of all private trucks by the ICC. Although ICC rules apply only to interstate trucks, many states pattern their regulations after those of the ICC.

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NEW YORK, Oct. 4.—American Petroleum Institute's automotive committee probably will now ask the Interstate Commerce Commission to postpone the Oct. 26 hearing at Washington until Nov. 21 (after the A. P. I. convention) so that an adequate presentation of the industry's case can be prepared, it was learned late today.

'Gas' Grading Law Looms For District of Columbia

N. P. N. News Bureau

WASHINGTON, Oct. 3. — Authority to begin "testing" motor fuel and lubricating oil sold in the District of Columbia has been given Washington weights and measures officials by a ruling of the acting comptroller general of the U. S., who approved use for this purpose of a $7500 item carried in an obscure corner of the D. C. appropriation bill passed by the last Congress.

According to George M. Roberts, weights and measures superintendent for the District of Columbia, who appeared before the House of Representatives committee on the D. C. last spring to urge passage of the item, no definite standards or tests have been decided upon as yet. That will come soon, he added.

The significant fact, however, is that Roberts, aided by other D. C. officials, was able to convince a congressional committee that such tests were "necessary" to "protect the public," and to have the bill passed. The same Congress which legislates for the District of Columbia also makes laws for the United States at large.

Several years ago a group of state officials recommended that Congress enact a law, similar to the Connally "hot" oil law, which would prohibit shipment in interstate commerce of gasoline failing to meet certain minimum specifications. But nothing was done about it.

"Speaking generally," Roberts told the committee, "I think the law should prohibit the sale of one brand or quality of gasoline or oil as a different brand or quality. That would prevent substitution of low quality products for high quality. Under present conditions the ordinary run of purchasers can be made victims of the worst form of substitution.

"The law should also provide for establishment of minimum grades of gasoline and oils which may be sold. In addition, it should also provide for the establishment of standards of quality for gasoline and oils represented as being of superior quality which are sold at a premium above prices of ordinary products.

"However, even without a law of the kind indicated, maintenance of a laboratory for making tests and publishing the results would, as I have stated, be of very great benefit. It would serve to concentrate attention upon fraudulent practices, and in that way act as a strong deterrent."

It was only this latter suggestion for a testing laboratory which found its way into the law. But Roberts has indicated that he may seek a gasoline grading law for the District of Columbia at the next session of Congress.

Roberts said that some years ago a bill he had drawn to regulate the quality of gasoline sold in the District was introduced in Congress. "There was considerable objection to it on the part of an attorney representing some of the oil companies," he said. "It was not acted upon."

NPN's Question Box On Wage-Hour Law

CLEVELAND, Oct. 4.—Effective date of the federal wage-and-hour law is less than three weeks away (October 24) but so far the businessmen of the country have had little information out of the Wage-and-Hour Division at Washington to judge whether their operations will be affected by the law.

Wage-Hour Administrator Andrews has declared that in administering the law he will be guided by Congress' intent that "as many workers as possible should be given the protection of basic labor standards."

That's the only official statement so far, but it is significant that the administrator will stretch the law as far as possible, leaving it to the courts to say where his jurisdiction ends.

Meanwhile, employers must make up their own minds as to whether they are under the law or not, bearing in mind the heavy penalties and civil damages for non-compliance. Wages in the oil industry, as a general rule, are well above the minimum specified in the law, but the maximum work-week of 44 hours (which figures out to five and one-half days of eight hours each) may hit some employers in the industry.

Taking up NPN's offer to attempt an answer to readers' questions, a number of letters have been received asking about possible effect of the new law on their operations.

Here are some questions from an Independent oil jobber in rural Michigan, with NPN's "best guess" as to the answers:

Question: We employ two truck drivers who deliver merchandise to the trade via tank truck in the country and village. Would they come under the new law? If so, what would be the minimum wage and maximum hours? What about overtime?

Answer: Truck drivers hauling out of bulk plants but not crossing state lines, probably will be held under both wages and hours sections of the law (See articles in N.P.N., Sept. 28th, for fuller discussion of truck drivers and bulk plants). Minimum rate of pay is 25 cents an hour, unless an industry committee is set up to recommend a higher rate—not more than 40 cents. Indications are that no such committee will be set up for the oil industry for some months, if then. Maximum work-week is 44 hours for the first year, with time-and-a-half for overtime, that is, 1½ times the employe's regular rate of pay and *not* 1½ times the minimum of 25 cents an hour. For example, if a truck drivers' wage is 60 cents an hour; his overtime rate will be 90 cents an hour.

Question: We employ five service station attendants who sell merchandise, grease cars, etc., from the stations—do they come within the law?

Answer: Service stations are apparently exempted either under the exemption granted to "local retailing" or to "any employe engaged in any retail or service establishment the greater part of whose selling or servicing is in intrastate commerce."

Question: Does a general manager or treasurer come under the law?

Answer: The law exempts employes " employed in a bona fide executive, administrative, professional . . . . capacity . . . . as such terms are defined and delimited by regulations of the administrator." The wage-hour division has given no indication of what general rule it will lay down on executive employes. Under the NRA oil code, a blanket rule was adopted, exempting from the code's maximum hours executive or supervisory employes who were paid in excess of $35 per week. Probably the wage-hour division will follow the same course, but at what salary the division draws the line, remains to be seen. A general manager or a treasurer very likely would be classed as executive or administrative employes and exempt from the law's maximum hours if their salaries were in excess of the specified amount.

Natural Gasoline

Several letters were received from natural gasoline manufacturers. Here is one with a plant in Texas:

Question: "We manufacture casinghead gasoline, butanes and propanes and deliver all our product to _____ company's pipeline at our plant. All products thereafter move under their control; without information to us as to eventual destination. We are not concerned as to wages, but hours might have to be adjusted in some cases."

Answer: Natural gasoline manufacturers, like producers and refiners, "produce goods for (interstate) commerce" as defined in the law. It is not necessary that the manufacturer himself be engaged in interstate commerce; it is sufficient, under the law's terms, that his product move, or is mixed with some product that moves, in interstate commerce. Unless a producer, refiner or natural gasoline manufacturer can *prove* that none of his product went beyond his state, he probably will be held under the law. The courts may not uphold this "production for interstate commerce" provision, but the wage-hour administration will endeavor to apply it as widely as possible.

A lubricant manufacturer in Illinois raises a borderline question about custodial employes.

Question: How about night watchmen under the wage-and-hour law?

Answer: The wage-and-hour administration—like the NRA had to do—probably will make an exception (at least as regards the maximum hours) for custodial employes, such as night watchmen, janitors, and similar employes whose hours are long but duties are chiefly of a care-taking or standby nature.

Trackside Station

A real borderline case is that of a trackside station. An Ohio trackside operator raises the question of his employes' status under the law.

Question: Are employes of trackage stations to be classified as retail service employes or as employes of a bulk distributing station?

Answer: Employes unloading tank cars very likely would be ruled "in interstate commerce." Those engaged solely in retailing would seem to be exempt; but the wage-hour division, striving to bring all workers possible under the law, might be inclined to stretch a point and hold them non-exempt, leaving it to the employer to take the case into court for a final ruling.

A farmers' co-operative oil company in Nebraska, operating entirely within one county and transporting petroleum products from a pipeline extending into the state, asks for NPN's opinion on how the wage-hour law would be applied to its operations.

Question: All our employes are working on commission, except our transport drivers, bookkeeper and general manager. Our transport drivers are driving only their 12 hours each day, as the law requires, and the bookkeeper works 44 hours per week. The manager works no regular hours but averages 48 hours per week.

Answer: Whether employes are paid straight salaries or on commission probably will make no difference as to their status under the law. Truck drivers hauling off of an interstate pipeline might come under the Motor Carrier Act; if so, their hours be subject to regulation by the Interstate Commerce Commission. Truck drivers whose hours of service are subject to ICC control are exempt as to hours, but not as to wages, under the wage-hour law. If these drivers are not subject to regulation by the ICC, then they will probably be held under the wage-hour law, both as to wages and hours because "transportation" is specifically included in the term, "production of goods for (interstate) commerce." (See article in N.P.N. Sept. 28 which had fuller discussion of possible rulings on bulk plants and truck drivers.) The bookkeeper's hours coincide with the maximum set in the law; his wages would have to be at least 25 cents an hour. The manager would probably be classed as an "executive". (See answer to question above.)

Reader Service on Wage-Hour Law

No official interpretations of the Fair Labor Standards Act (federal wage-and-hour law), effective Oct. 24, have been issued as yet by authorities at Washington. Last week's N. P. N. carried an article endeavoring, on the basis of available information, to forecast how the new law may be applied to the oil industry.

Letters from readers have poured in, asking questions and requesting copies of the new law. Some of the questions, with N. P. N.'s answers, are published on this page.

N. P. N. has obtained a new supply of official copies of the wage-hour law and will supply copies to any reader requesting the same, as long as the supply lasts.

For readers seeking information on possible effect of the law on their operations, N. P. N. will attempt to answer their questions according to information now available. N. P. N., of course, can assume no responsibility for accurately predicting how the wage-hour administration at Washington will eventually rule.

Send all questions and requests for copies of the law to NATIONAL PETROLEUM NEWS, 1213 West Third St., Cleveland, Ohio.

Long Margins are Blamed for Retail Price Wars

N.A.P.R. 'Marketing School' Is Told

Long Margins Help Unbranded Dealers

By E. L. BARRINGER
N. P. N. Staff Writer

ST. LOUIS, Oct. 1.—Long margins bear the brunt among causes for unfavorable retail price situations Prof. Leon A. Bosch, of Evanston, Ill., assistant professor of marketing and management at Northwestern University, told dealers and lessees in an address during the annual convention of the National Association of Petroleum Retailers in St. Louis Sept. 27 to 29.

Long margins, in some instances as much as 70 per cent on gasoline, are unsound for a staple item, he said, and are "not consistent with sound business practice nor community obligations." A cry for a law arises from price cutting, he continued, but "unless you are convinced that large measures of government domination in the oil business are desirable, do not be too eager in inviting legislation."

The Bosch address reviewing retail buying, pricing and merchandising was part of the association's School of Marketing conducted during the annual convention, with most of the speakers this year members of Northwestern University's faculty.

Significant was this crackdown on long margins in view of numerous demoralized retail markets in large consuming areas at the present time, and of more significance was such a statement made before a retailers' meeting without violent protest or challenge.

Significant also the address may be as marking a turning point in dealer and lessee management of retail markets under the Dealer Marketing Plan, towards intensive study of actual costs and adequate margins in a field now an outstanding laggard compared to cost data assembled in other retail marketing fields.

When major companies and some jobbers two short years ago withdrew from retailing the market was turned over to dealers who formerly set their own price by following gasoline prices of major competitors, and lessees who formerly were in the main station managers or employes. The new regime promptly sought achievement of the dealer's cry of "we want more margin." Larger margins followed, so did some of the industry's most devastating retail price wars.

Yet only one question came from the floor after the Bosch address directed towards margins—that of what is a fair margin. The question obviously was one seeking information, not challenging the statements. Professor Bosch replied that a direct answer was not possible but certainly "it is not the 5.5 or 6 cent margin" mentioned by a Pennsylvania retailer the day previous as the margin prevailing in his territory.

Causes of Price Wars

Five suggested causes for unfavorable price situations were offered by Professor Bosch. They are: fear of slackened gallonage, the building of more stations than is needed, overproduction of gasoline, fundamental economic and competitive aspects of the industry, and finally "greedy and uninformed dealers."

"It is this last point which deserves additional comment here," Professor Bosch said. "A survey of posted prices after the Dealer Marketing Plan went into effect revealed increased margins to the dealers.

"A study of tank wagon and retail prices shows that the latter have not always followed reductions in tank wagon prices. Margins in some instances of 70 per cent on gasoline, an article which is a staple item, a convenience goods to consumers, which enjoys a rapid rate of stock-turn, is not seasonal, nor subject to style change, are not consistent with sound business practice nor community obligations.

"From a business point of view, the margins do not hold on products for which marketers have been largely unable to establish brand quality recognition. Customers begin buying outside the area, new competitors are attracted to the business, with the whole situation aggravated by motorist knowledge that affiliates of some major companies sell gasoline identical with their branded output at less money.

Long Margins Help Unbranded

"The high margins strengthen the position of companies selling the unbranded gasolines of high-octane values," Bosch continued. "Some stations in the interests of recovering, maintaining, or increasing volume begin discounting. Others make reductions, and soon the retail price structure collapses, signs come out, and 'they're off.' Once started it is difficult to stop, and the road back to profitable margins is a long and difficult climb with some operators never making the grade.

"Out of the situation there generally arises a cry for a law. At the present time considerable interest is found in price maintenance and below-cost selling laws, but even these must still rest on the honor, integrity, and common sense of the retailers to make the laws work. Price maintenance may offer some aid to the industry's price problems, and if other articles may be sold under their alleged protection, there seems to be no good reason why gasoline should not be allowed to be so sold.

"Fundamentally, however, the solution must rest with the retailers because policing would be extremely difficult and evasion probably always attractive to some operators. That the gasoline price situation is a complex affair can be understood by the most casual observer if he will but recall that probably the most important reason for oil companies leasing all stations was to escape immediate responsibility for dealer margins.

"Time has now shown dealers the baffling forces in competitive retail pricing including as it does all types of marketers and consumers. It is reported that lack of interest is shown by some supplying companies in enforcing nominated prices. This lack of interest is probably due to a fear of loss of gallonage unless all suppliers participate in stipulating resale prices. In addition, I know that some company representatives feel that the task of policing the laws is well nigh impossible and assuming such responsibility merely means taking on a job that the companies were eager to rid themselves of several years ago.

"While it is true that enforcement determines the wisdom of any law, it may be that price maintenance legislation may minimize the most serious price disturbances. The prevention of all illegalities may be impossible and so affront the law itself, but in so doing it would not be far different from most other laws on the statute books.

Watch Minimum Price Laws

"In any event, watchful waiting of California, New York, and New Jersey experiences is in order. Regarding legislation in general, however, let me remind you that if every interest could get the necessary laws passed to regulate the other fellow, not even college professors would remain unregimented. Ask any student, athletic coach, or board of trustees. Unless you are convinced that large measures of governmental domination in the oil business is desirable, do not be too eager in inviting legislation.

"The gasoline retail price problem ideally should be solved through voluntary action and strong leadership. It is bodies such as the one I am privileged to talk to this afternoon that give high promise of developing the needed leadership because of its principles of dealer education, fairness of competition, and social, as well as selfish, objectives," Bosch said.

'Don't Take on Everything'

In buying their merchandise, Professor Bosch told the dealers that "not all the merchandise wanted by motorists is wanted at service stations," and suggested the following means of determining consumer preferances of products and of the place to buy:

"Asking customers what they might like to buy at the station.

"Keeping a list of the items or services requested by those who enter the station.

"Keeping eyes and ears open for suggestions or hints which are dropped in the conversation of car occupants while getting gas, or waiting for and receiving other service.

"Determining the emergency merchandise for householders or motorists that you might carry on a good will-service basis."

Retailers were advised to select a dependable source of supply for merchandise and "buy in quantities only large enough to meet sales requirements between jobber deliveries. Where merchandise is sold in volume, quantity discounts may suggest the economy of somewhat larger purchases, but avoid quantities so large that it seems to take an age to get your money back. Not only does it increase inventory expense, but it often has the effect of lowering respect for the article itself on the part of station attendants."

Why Station Tire Sales Gain

Professor Bosch related that in 1930 oil companies sold only 3 per cent of compulsory replacement tires, 15 per cent in 1937 because:

"The marketing set-up of the

N.A.P.R. Elects Officers

ST. LOUIS, Oct. 1. — National Association of Petroleum Retailers, meeting here this week, re-elected Vice Presidents Frank H. Ellis, Pittsburgh, and Roy Bosworth, Chicago, and Board Chairman Fred L. Brewer, LaGrange, Ill. Term of Wilmer R. Schuh, Milwaukee, does not expire until next year.

The following new directors were elected: W. B. Wylie, Paul Davis, Alden Connor, and J. P. Gibson, all of Los Angeles; Harry Griebling, Denver; Hugh Pallister and Fred Kreiner, of Cleveland; J. R. Connery and Fred G. Kenvin, Houston; R. E. H. Gaedke, Fort Worth; Don Norbury, Des Moines; Phil Multhauf, Newton, Iowa; Jesse Hawley, Davenport, Iowa; C. T. McQuillan, Louisville; Nelson E. Owen, Rochester; and Richard Floyd, Harold Fox and David W. Shaw, all of St. Louis.

oil companies is favorable including credit, delivery and warehouse facilities, and salesmen.

"The retail petroleum dealer has the first selling opportunity on tire replacements.

"Tire sizes have been simplified so that large stocks are no longer needed. Tire manufacturers say that 90 per cent of the passenger car replacement tire business can be served by four tire sizes, 4.75 x 19, 5.25 x 18, 5.50 x 17, and 6.00 x 16.

"Petroleum companies can now buy on better terms than some years ago when the oil companies were not particularly favored as tire outlets. This means a better competitive opportunity for the petroleum retailer.

"Retail petroleum outlets need something on which to make profits and tires offer a logical avenue for this revenue."

Selling Program

On merchandising in the service station Professor Bosch pointed out that goods may be bought correctly, priced fairly and still have much sales resistance. The gasoline merchant's selling program, he continued, presents problems of advertising media, station displays, and station salesmanship.

Advertising is necessary, retailers were told, as "the individual station must be sold; the suppliers' general advertising cannot do that."

In displays, retailers were urged to glorify their merchandise, and to build displays that get attention "because 75 per cent of the motorists leave service stations within four minutes."

Two elementary display rules given retailers were "segregate the various items on display, thus avoiding a clutter of spark plugs, fly spray, and sun glasses in a display, and use open cabinet displays so customers can read and handle the product."

Trade Associations

Professor Chester E. Willard, of the Northwestern University School of Commerce, listed three justifications for a trade association. They are "what the association does and can do for the good of the industry which it represents . . . . what the trade association does or can do for its members . . . . what the members do and can do for the association in the way of its further advancement and development."

"Trade associations make their greatest progress when conditions are adverse," Professor Willard observed.

"Currently, one of the most vital services of an association is its work with government relations. This is particularly true of associations whose membership is made up of small individual units.

Government Relations

"The constant increase in the regulatory measures, the seemingly unending reports required, and the veritable flood of questionnaires frequently create hopeless confusion in the minds of the small business man. Often he has neither the exact information available nor a thorough knowledge of what is wanted. His trade association is of incalculable value in helping him with these problems.

Bookkeeping Fundamentals

Fundamentals of bookkeeping were discussed by Prof. Ira D. Anderson, also of the Northwestern University School of Commerce.

Five steps as a guide to selling were offered retailers by S. B. Magill, of New York, independent lubrication engineer. They are:

"Know your prospect . . . .

"Believe in your product . . . .

"Know that your prospect can use the product. Put him in the picture. Don't attempt to sell a lot of chromium license frames to the driver of a ten year old ark. More important, don't try to sell a new car owner some shoddy fittings that will get rusty in a month.

'Consider your prospects viewpoint . . .

"Close with confidence. In all your contracts be cheerful. Look prosperous and speak optimistically. Money is still in circulation, and you want your share. The rewards today go to men who never admit the possibility of failure."

Oil Advisory Board Urged By Retailers

ST. LOUIS, Oct. 1. — An invitation to trade associations in various branches of the industry to participate in a permanent Petroleum Industry Advisory Board to discuss mutual problems was issued by the National Association of Petroleum Retailers in annual convention here Sept. 27-29.

The invitation, a resolution adopted by the board, is for all branches through their associations to meet with officials of the national retailers' association to lay a foundation for a permanent advisory board.

Seven planks were submitted through the resolution as a platform for the proposed board, calling for unity within the industry and an advertising program to stimulate consumption of petroleum products and to educate employes and consumers on accomplishments of the industry.

The association took steps to arouse the dormant marketing code, submitted two years ago to the Federal Trade Commission, adopting a resolution empowering executive officers to seek favorable action on the proposed code.

While the board was meeting to write the two resolutions the three-day convention heard merchandising addresses in a "marketing school," held open forums on retailer problems, elected officers, attended a banquet and a fun fest of the Grand Knights of the Hose.

Of most interest to retailers, judging by the open forums, are fair trade laws, aside from local price reductions and shrunken margins. While attention was centered on California, New Jersey and New York fair trade laws a ground swell of sentiment was apparent against rushing into legislative halls, seeking laws to remedy marketing evils, that might ultimately lead to the industry becoming a "public utility."

Oil Advisory Board

The resolution for a permanent advisory board noted that turmoil within the industry causes retailers "annually the loss of several millions of dollars;" also, that retailers, as the single largest group, were "in a logical position to promote solidarity within the petroleum industry."

The seven planks offered as a platform for the proposed advisory board are:

"We believe in a united industry.

"We believe that a body representative of the industry can accomplish much toward achieving industry unity.

"We believe that there exists a mutuality of interest throughout the industry that needs but an interchange of ideas and a voice to bring about that desirable unity.

"We believe that such a body can consider effectively, impartially and helpfully all proposals affecting the welfare of the industry as a whole.

"We believe that such a body must not supplant but may supplement and co-ordinate the existing recognized associations.

"We believe in an industry advertising program to promote consumption of industry products and an institutional advertising program to educate employes and consumers upon the importance of the industry in the general welfare and upon the accomplishments of the industry.

"We believe a petroleum industry advisory board can accomplish the purposes herein set forth and that such a board should be created and should build a platform composed of all planks upon which there is mutual agreement."

H. A. Inness-Brown, publisher of Gasoline Retailer, urged the formation of such an advisory board in a spech at the N.A.P.R. banquet.

The annual report of the committee on legislation noted opposition of the association during the past year to the oil marketing divorcement bill, anti-chain store bill, and the fuel oil tax bill before Congress.

"The committee at all times has endeavored to pursue a middle of the road course, veering neither to the left into radicalism or to the right into conservatism," the report stated. "In every instance we have studied the proposition from this angle — what will be its ultimate effect on the petroleum retailers. Sectionalism or our individual viewpoints at no time influenced our decisions."

Warns Against Oil Control

The report concluded with the following on legal marketing evil remedies:

"From time to time we find politicians advocating that the petroleum industry be placed under government control. Sometimes because of the wave

(*Continued on page* 20)

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Oil Probe Clouded By Pennsylvania Scandals

Against a new background of some of the grossest scandal in any state's history, the Pennsylvania special committee investigating the oil industry, is planning to proceed with more probing and a final report.

The committee has shown every inclination to insist that the oil industry's management of its affairs should be required by law to be entrusted to officials of the state.

Around any new report with such recommendations by this oil committee as it is presented to the Pennsylvania legislature this winter, will be loud reverberations from the investigation of another committee into how legislation was obtained.

Of the recent developments by this committee, from the examination under oath of the state's former Attorney General Margiotti, the Philadelphia Inquirer says,

"Out into the open have been forced detailed charges, naming names and giving chapter and verse, of the most serious and scandalous nature directed at some of the highest-placed officials of the Commonwealth.

"Those charges, read into the record by a former member of Governor Earle's cabinet, concern bribery and corruption of the most offensive kind. They gravely allege that state legislation favorable to brewery and motion picture interests was bought and paid for across a political bargain counter, with high Democratic officials engineering the deals. They name $50,000 as the amount paid for brewery laws and twice that sum for Sunday movie legislation."

Nor have such charges and information been strange to Pennsylvania's history. Nor is Pennsylvania alone in such charges. Ohio has just finished a gubernatorial campaign over "legal graft." The governor, who is being retired, insisted that if the "graft" was "legal" that ended it and he blocked all legislative and grand jury effort to find out if the "graft" was "legal." Other states also have suffered such type of political administration.

The point for the oil industry to consider, as well as for those in other industries, is whether it wants to have the supervision of or management of its business shoved into this kind of a political mess?

Do you want to have to plow into such a bad odor and feel your way around blindly to the particular office where you apply for a license to do business, or a license to continue your business, as an oil distributor or operator of a service station?

What kind of treatment do you think you might get and what might you not fear you would be called on to do after you finally confronted the political power that could say you live or die as a gasoline distributor?

Regardless of the honesty and good intentions of Pennsylvania's oil investigating committee, its efforts certainly will be under a grave and serious handicap this fall and winter. No matter how pure the committee's motives may be, if their report undertakes to send the oil marketing business under state control, the fact that it may be *this kind* of political control, will of itself, damn the report. No matter how unjust it may be, the suspicion will undoubtedly lie in every oil man's mind, that these corrupting forces of Pennsylvania's politics may also be seeking a hold on the oil business, which they hope will be lucrative.

This suspicion will be the more aggravated by the fact that a great many people can see no rhyme or reason for such proposed government control of oil or any other business.

Perfectors of Accurate Merchandising

The oil industry is strong not only because of its own oil trade associations but also because of the associations of the industry's allied industries from which it draws its supplies and equipment.

Today the oil industry can applaud the fifth anniversary of the Gasoline Pump Manufacturers' Association, which celebrated at Dearborn, Mich., with a birthday party last week.

To the members of that association, few in numbers but all there are in the vending pump industry, the oil industry can give thanks for the development by private initiative and private capital, of ever increasingly more efficient and accurate measuring and sales devices for gasoline and oil.

From the day of the old tin pump with a stick for a plunger and what often was an old rag for a packer, to the present highly accurate, swift serving computer pumps, is only a matter of 25 years or so; but the road of research and experiment and investment for new ideas, that has been traveled by these manufacturers was long and hard, but of great service to the oil industry and to its customers the gasoline consumers.

So our greetings to the association and to its creator, G. Denny Moore of New York, now not only its managing director, but treasurer, secretary and president.—WCP.

Whose Promise Have the Butter Price Hoisters

A private organization, acting, it is said, at the instigation of the Department of Agriculture, has been buying some fifty million pounds of butter to give the butter price a little hoist. So far the private organization and those who co-operated with it—for a profit it is said—have not been indicted. But maybe the Department of Justice knows that the Department of Agriculture will stand behind its agents in "price affecting". But what assurances as to that have the men in the butter business?

Oil Compact Commission's Meeting Is 'Peaceful'

New Governors of Oklahoma and Texas Attend and State Their Views on Oil

N. P. N. News Bureau

TULSA, Oct. 1. — Meeting of the Interstate Oil Compact Commission here Sept. 29 failed to develop the expected "crisis" over Kansas' proposal for revamping the compact but it did bring together the governors-nominate of Texas and Oklahoma.

W. Lee O'Daniel, whose election to be governor of Texas is a November formality, was escorted to the stage by the present governor, James V. Allred, who introduced him with the declaration that he believed O'Daniel would be a "great governor."

O'Daniel, whose cyclonic campaign was the talk of the nation, indulged in a few pleasantries of the kind that brought out huge crowds in Texas, pledged sympathetic attention to the oil problems when he takes office. Possibly a prediction of what is to come was contained in his remark that he hoped for the continued prosperity of oil men in his state.

"We have an old age pension pledge and we will have to get the money from those who are prosperous," he said. "I solicit your co-operation — in that respect."

Leon C. Phillips, who will be Oklahoma's next governor — unless the Republicans win for the first time in the state's history — said he would do all he could to further the interstate compact. He followed Gov. Allred, who declared for regulation by the states, by uttering a vigorous "Amen." He said that he was one of those old-fashioned persons who believe that some part of government should be left to the localities and to those engaged in business. Oklahoma, he said, will try to get along on its present income.

The meeting came at the wind-up of the annual conference of governors which began in Oklahoma City and ended in Tulsa. Several of the 14 governors remained for the compact session and the barbeque given by Frank Phillips on his ranch near Bartlesville. The only formal business done by the compact commission was the re-election of all officers, including Col. Ernest O. Thompson, chairman of the Texas Railroad Commission, for a third one-year term as compact commission chairman. Nomination of Col. Thompson was made by Gov. E. W. Marland, Oklahoma, who took the lead in organizing the compact in early 1935 and who was chairman the first year.

Compact Expires Next Year

The compact expires by its own terms next Sept. 1. To renew it there must be affirmative action by the legislatures of the member states and by Congress. since these bodies meet early in 1939, the start must be made soon to get such action.

Such start was to have been made at the Tulsa meeting, but there was a delay. Kansas has insisted for several months that the instrument be rewritten and Gov. Huxman has intimated several times that Kansas has no interest in continuing as a member unless changes are made. Especially does Kansas want a provision for federal representation and a method of allocating market for crude oil among the producing states. It maintains that fair share of the market is now denied Kansas, considering its potential production and reserves.

Kansas Lacks Support

Kansas hasn't had much support within the compact commission. Oklahoma sees any transfer of demand, if that could be effected, would be chiefly at the expense of Oklahoma. New Mexico and Texas would not stand to lose anything, perhaps, as their outlet is to areas where Oklahoma and Kansas crudes do not go. Texas, however, objects on principle to any federal participation and to the making of the compact commission anything except a body engaged in the study of methods of preventing physical waste, with no authority to do anything except report the results of such studies to the legislatures for consideration.

Colorado has so little crude production that its interest is one of principle involved; however, to date, it has supported the Texas position. The sixth member, Illinois, is getting a big "play" in development and is not inclined to favor market transfer. Thus Kansas is making a single-handed fight.

Representatives of the compact states met Sept. 28, day before the called session, and debated vigorously the question of rewriting the compact's charter. This was a closed meeting. Echoes that came out of it indicated that there was some lively discussion, with the lines holding just as they were when it started. So, in the open meeting on the 29th, E. R. Sloan, chairman of the committee appointed at the July meeting in Colorado Springs to prepare a report on renewal of the compact, asked for further time. This is a committee of the whole, as all member states are represented on it. Judge Sloan, who is chairman of the Kansas Corporation Commission, asked for authority to call a meeting within the next 60 days to prepare the report.

So, the advertised "crisis" was delayed, maybe averted. Some saw in the remarks of Judge Sloan in the open meeting an indication that Kansas will go along on the basis favored by the majority and that now appears to be renewal of the compact on its present terms. Judge Sloan asserted that one of the strong points of an American's makeup is his ability to be a "good loser." Seemingly, he was referring to the spectacle of Col. Thompson, runner-up for governor of Texas, introducing O'Daniel, the winner, to speak. But from this Judge Sloan went into a short discussion of the Kansas situation and said that the commission he heads was going along, trying to handle its problems and "hoping for the best."

All six member states were represented and there were observers from Louisiana, California and Indiana among producing states and Delaware, non-producer. Representatives of the two last named were the governors.

Illinois Oil Law Seen

William Bell, representing Illinois, predicted that his state would enact conservation laws at an early date. Gov. Henry

Economic Well-Spacing Will Be Topic At I. P. A. A. Annual Meeting in Tulsa

N. P. N. News Bureau

TULSA, Oct. 1.—Featuring addresses by Donald R. Richberg, former NRA administrator, and Col. Ernest O. Thompson, chairman of the Texas Railroad Commission and of the Interstate Oil Compact Commission, the ninth annual meeting of the Independent Petroleum Assn. of America will be held here Oct. 19-21. Attendance of 1500 is forecast at this meeting representative of independent producers of the country.

Those in charge of the program are satisfied this convention will provide the most comprehensive discussions of current and future oil industry problems of any meeting yet held by this association, although its meetings the past three or four years have set a high standard.

Richberg will speak at the annual dinner the night of Oct. 21. Col. Thompson's address will be given at luncheon Oct. 20.

The association's executive committee will meet at dinner in the Mayo hotel, where all sessions are to be held, the evening of Oct. 18. Wednesday, the 19th, will be devoted to committee sessions. In these meetings the several reports to be presented in general sessions will be completed.

Registration desk will open at 8 a.m. Oct. 20 and at 9 the first general session will be started.

The annual address of the president of the association, Charles F. Roeser of Fort Worth, will be presented at this session. The address of H. B. Fell of Ardmore, Okla., executive vice president, entitled "Co-operation and Stabilization" will also be presented at this time.

Russel B. Brown of Washington, general counsel of the association, will give his report at the afternoon session Oct. 20.

R. A. Cattell of Washington, chief engineer of the oil and gas division of the U. S. Bureau of Mines, will speak at this session on; "The Value of Recent Studies of the Bureau of Mines to the Oil Industry."

H. G. Moock of Detroit, vice president of the Plymouth Motor Co., will speak at the luncheon Oct. 21.

Although the various committee reports dealing with subjects of wide interest to the industry are styled simply reports, they will as usual constitute broad discussions of the topics. The report of the committee on unnecessary and unprofitable drilling, for instance, will explore a subject that has held the attention of producers and state conservation officials for several years. Two previous reports by the association's committee have dealt quite specifically with this problem and have made suggestions. Some progress is being made in several states along the line of its original recommendations.

Horner has said that he favors measures that will promote orderly development and waste prevention.

Dr. A. H. Bell, of the Illinois Geological Survey, brought the commission and the audience up to date on the development in Illinois. A striking point in his discussion was that Illinois, producing about one-tenth of its requirements prior to the new fields, is now making about half the amount of crude oil required for the average monthly consumption of products whose crude oil equivalent is about 5,000,000 barrels monthly. That does not mean that much Illinois crude is used in Illinois; much of its output is refined in Ohio and Kentucky, merely that the state now produces about half as much oil as it uses.

100,000 Barrels Daily

Dr. Bell said he believed production would pass the 100,000-barrel mark this year and that the present campaign would result in exceeding the peak of about 100,000 barrels reached some 30 years ago. Since April 28, when he made a report to the compact commission in Wichita, five new fields have come in and there are 16 new ones all told since the first of 1937.

Most important of the five new ones named is the Lake Centralia field, some eight miles east of Centralia. It was opened July 6 with a 730-barrel initial production well in the Benoist sand. Proved area is now 8700 acres, he said.

To sustain production, drilling must continue at a brisk rate, Dr. Bell said. Although the total number of wells in new pools has increased from 528 at the end of April to 1108 now, the average production per well daily has dropped from 72 to 67 barrels.

Daily production of the state had reached 86,830 barrels, at the time Dr. Bell reported. Of this 12,698 barrels was from the old fields whose 13,935 wells average 0.9 barrel daily. Average recovery to date for all old fields in the state has been 4400 barrels per acre, and this may be increased by flooding and repressuring by as much as 25 per cent, Dr. Bell thought. More data are needed to make estimates on the reserves represented by the new fields, he said.

Save 25c Per Barrel

William Bell, the compact representative from Illinois, said there is demand for all the Illinois oil, as refiners save 25 cents and more per barrel in transportation charges over the cost of getting Mid-Continent oil to the plants in Ohio, Illinois and Kentucky that now process the crude. Within the area where Illinois crude may go — Indiana, Illinois, Kentucky and Ohio — there is total refining capacity of 456,700 barrels daily.

Col. Thompson told the meeting that in Texas, by using the five-day production week plan, the state's allowable has been cut about as far as it can go. In some instances, he said, physical waste is being caused by setting too low an allowable resulting in inefficient use of reservoir energy. Correction is made by the commission of such conditions where they are brought to the regulatory body's attention, by increasing the allowable of the field, he said.

Pipeline Proration

In the meeting proper the question of "pipeline proration" was not mentioned, but at the luncheon the same day Charles F. Roeser, president of the Independent Petroleum Association of America, suggested that regulatory bodies include in their proration orders a provision which would cover the ground substantially as follows:

"Because in the exercise of its jurisdiction the (name of state commission) has fixed the allowables in the foregoing order according to law in such manner as equitable to allocate among the several pools in the state their several portions of allowable production during the period covered by this order and in order that no common purchaser of oil within the state may unduly disturb such equitable allocation made by the commission, it is further ordered that no common purchaser of oil within this state shall limit its production from any lease or property in any pool below the allowable fixed for such lease or property unless at the same time and during all times of such limited purchase such common purchaser limits its purchase from all properties from which it is purchasing oil to the same extent."

Four Summaries Will Cover 50 Papers At Bituminous Conference Oct. 10-13

N. P. N. News Bureau

TULSA, Oct. 3.—The Montana Bituminous Conference has joined with the National Road Oil and Asphalt Congress and the Mississippi Highway Department to hold the Montana National Bituminous Conference at the Edgewater Gulf hotel, Edgewater Park, Miss., October 10, 11, 12 and 13. The National Road Oil Congress is sponsored by the Western Petroleum Refiners Assn.

Following the procedure of the joint meeting last year in Montana, this year's program is divided into four major parts—Research, Fundamentals of Bituminous Construction, Construction, and Maintenance. Members of each of the four committees will prepare a paper, which will be reviewed by the chairman of that section. The gist of the papers will then be incorporated into a summary which will be given by the chairman. This means that while some 50 or more papers will be prepared, actually only the four summaries will be presented before the general sessions for discussion.

D. A. McKinnon, Montana state highway engineer is general chairman of the conference. The Monday morning session will include the address of welcome by Gov. Hugh White of Mississippi, the response by Gov. Roy E. Ayers of Montana; an address by Senator Pat Harrison, followed by addresses on "The Contractor's Viewpoint" by M. W. Watson, chairman of the highway division, Associated General Contractors of America, and on "Research Attack on Bituminous Surface Problems," by Roy W. Crum, director of the National Highway Research Board.

The Research Section will present its report Monday afternoon, Oct. 10. The sessions Tuesday, Oct. 11, will be devoted to reports of the Fundamentals and the Construction Sections, while the Wednesday morning session, Oct. 12, will be given over to the report of the Maintenance Section. The business session will be held Wednesday afternoon.

Three Bids at Tulsa Auction

TULSA, Oct. 1.—First public offering of leases, royalties, oil payments and fee lands, held Sept. 30 by the newly formed Auction Board of Trade, Tulsa, resulted in no sales. Sixty parcels were offered, three bids were made but were rejected as too low.

Colonel E. Walters, the first part of whose name is not a title but is what he was named, was the auctioneer. He has cried all the sales of oil leases in the Osage. He told the audience that to the end of August he had disposed of by auction properties that brought a total of $178,474,758.58 during his career as auctioneer.

Another offering of properties will be made in about six weeks, according to Earl Sneed, president and founder of the Auction Board of Trade.

Coal's Outcry Draws Retort From Pipeline

N. P. N. News Bureau

WASHINGTON, Oct. 3. — Striking back at the coal industry's attempts to block construction of its proposed Kansas-Minnesota natural gas pipeline, Kansas Pipe Line and Gas Co. has filed with Federal Power Commission a statement requesting that the coal petitions be ignored.

"The apprehension of the coal interests," says the statement, "is the best argument for the soundness of the proposed line and the public demand for this new fuel. They say in effect, 'The public wants this new fuel but it will hurt our business—don't let the public have what it wants.' It is paradoxical, indeed, for these petitioners to lay claim to an appearance in the public interest when by that very appearance they seek to thwart the wishes of the affected public."

The pipeline retort was aimed at petitions filed by National Bituminous Coal Commission, United Mine Workers (C.I.O. affiliate headed by John L. Lewis), National Coal Assn., and Northwest Retail Coal Dealers' Assn., all seeking to intervene "in the public interest" in any hearings or other action which the power commission might take on the application.

The coal industry petitions indicated the industry would attempt to forestall construction of the line on the basis that it would disrupt the coal industry in northern Minnesota, the iron ranges, to which it would extend, as well as in the territory through which the line would pass en route from the Kansas gas fields.

Outcome of this first clash between the natural gas industry and the coal industry under the recently enacted Lea natural gas Act will establish a precedent by which similar controversies will be settled in the future, it is expected—controversies which will arise whenever the natural gas industry seeks to extend its lines into new territory which depends, from necessity, upon coal for fuel.

Meanwhile, a second natural gas company has sought FPC authority to construct a pipeline into the Minnesota iron ranges. Public Service Gas Co., a Montana corporation with offices in Minneapolis, has filed a petition to build a 1500-mile, $49,000,000 line from Montana and Wyoming, through North Dakota, into South Dakota, Minnesota and Wisconsin.

More Refiners Make Own Terms on Price of Crude

(*Continued from page* 5)

1 in East Texas of 10 cents a barrel and the reduction in the price of Smackover later, the major crude purchasers have not taken formal notice of the many local arrangements being made by the smaller refining companies to secure their crude supplies at less than posted prices.

These readjustments in most cases are by refiners processing crude from settled properties, where higher gathering costs prevail, and they are in most cases refiners which ship by rail and do not have the advantage of lower cost gasoline pipeline transportation to their marketing areas.

Approximately 4000 barrels daily of production from approximately 6000 wells in eastern Osage county, Okla., will have to seek a new outlet Oct. 15. On that date Barnsdall Oil Co. will cease purchasing crude in that area.

A letter from this company to its eastern Osage county producers states; "Barnsdall Refining Corp. have advised us that, because of conditions over which they have no control, they can no longer continue to operate their Barnsdall (Okla.) plant."

In elaborating on this announcement, one executive said it was not possible to continue operating the refinery at present prices for refined products and the prevailing posting for crude oil, in areas where gathering costs are high, such as in eastern Osage county.

The recently modernized 5000-barrel Barnsdall refinery had been supplying gasoline in the middle west through the Great Lakes gasoline pipeline.

Shell Petroleum Corp. is the only other crude buyer in eastern Osage and is taking about 2500 barrels daily.

Only one royalty owner is affected in the Osage reservation portion of the territory affected by the suspension of purchases. Oil in the reservation is administered by the federal government for the tribe as a whole, without regard to surface allotments.

TULSA, Oct. 1.—The remark of Col. Ernest O. Thompson, chairman of the Interstate Oil Compact Commission, in the Tulsa meeting Sept. 29 that despite the fact that production has been held down through proration to the point where crude oil stocks approach a 17-year low, the industry is suffering from "economic maladjustment" neatly summarizes a condition for which nobody proposes a clear-cut and definite solution.

Some criticism was voiced at the meeting of refiners for maintaining what was called too high a rate of operating. This has resulted in the withdrawals from crude stocks, at the expense of current production. How much farther such withdrawals will proceed there is no predicting.

This tendency to pare down crude oil stocks probably is a product of proration. Under the system prevailing in principal producing states of setting quotas of production for fields oil is held in its natural reservoir. Over the past three years some companies have abolished large tank farms, emptying storage and calling in the junk dealers. Some of the oil thus emptied into trade channels had been in storage for years. This process is continuing in several places.

Oklahoma is standing on its 428,000-barrel daily allowable for October, unchanged from September and August, except that percentage reductions are to be made in the fields that overproduced in August so as to keep them at the level fixed in the order.

Kansas allowable has been set at 163,400 barrels daily, which is higher than the forecasts of demand supplied the Corporation Commission by purchasers.

An important development in Texas is the prospective new outlet for the K. M. A. pool. This was first reported to be in the making by NATIONAL PETROLEUM NEWS several weeks ago. This writer now learns from a reliable source that the construction of a pipeline from the field, which is in Wichita and Archer counties, near Wichita Falls, is assured and that construction probably will be started in about 30 days. It will be 10-inch, according to the source of our information, and will go to a Gulf Coastal port.

Formal announcement of this project has not been made by the company that has appeared as its backer. This is the Hope Engineering Co., a nationally known engineering company, whose president, B. E. Hepler, has recently been in Wichita Falls making arrangements for crude supply. It is said that about 20,000 barrels daily will be available from producers pledged to sell to this line by completion date, or more, depending upon the allowable set by the Railroad Commission.

Whether this marks the entry of the Hope company into the business of buying and selling crude oil or whether Hope is acting for other interests is not ascertainable now.

The field shutdown idea has reached Arkansas, whose Conservation Board has ordered the part of the Rodessa field which lies in Miller county to be entirely closed for the period Oct. 20-27. Survey will be made on methods of preventing waste, including return of gas to the producing formation. This part of the Rodessa field is making about 6000 barrels daily.

Convention Program Of Indiana Jobbers Features Price Law

INDIANAPOLIS, Oct. 4. — State fair trade laws permitting manufacturers to specify resale prices for branded products, will be an important topic on the program for the fall convention of the Indiana Independent Petroleum Assn., at the Hotel Severin here, Oct. 12 and 13, according to George Hofmayer, executive secretary. Charles J. Bensky, counsel for Petroleum Dealers' Chamber of Commerce, New York, who is engaged in trying test cases under the New York state fair trade law, will be the speaker.

Other speakers are; R. S. Williams, Gaseteria, Inc., Indianapolis, who will talk on the problems facing Indiana jobbers; E. V. Weber, Eureka Oil Co., Reading, O., and president of the Ohio Petroleum Marketers Assn.; and P. O. Ferrell, vice-president, Real Silk Hosiery Mills, Indianapolis, who will talk on salesmanship.

Two humorous speakers are also scheduled, as are a banquet and floor show for entertainment.

Grant Tidelands Drilling Right

N. P. N. News Bureau

LOS ANGELES, Oct. 1. — Right to drill for oil on approximately 870 acres of California tidelands offshore from the Huntington Beach field, was granted Southwest Exploration Co. as low bidder of three companies qualifying in the race to get leases on the valuable under-water reserves.

The new California State Lands Commission in awarding the contract for development of the state-owned tidelands, specified that work must be started on at least two wells within 30 days and that two strings of tools must be kept busy until a minimum of 18 wells have been drilled.

Marketing Law Study By WPA Is Hushed Up

WASHINGTON, Oct. 3.—Classified as "too hot to handle" on the New Deal box score, the ambitious survey of the economic effects of state marketing laws undertaken by Works Progress Administration a few months ago (N. P. N., August 3, p. 12) has been dropped.

The reason given by WPA Administrator Hopkins was that the survey might conflict with the work of the O'Mahoney committee.

As originally setup, the survey was to include economic and legal sections. The legal section has been retained, but it will be little more than a compilation job on the various state statutes now in effect.

How these state marketing laws affect the distribution of petroleum products was to have been one of the major phases of the economic side of the study, it was said when the survey was undertaken. The economic side would have gone into effects and operation of all federal and state laws affecting retail distribution, such as the Tydings-Miller and state resale price maintenance laws based upon it, state laws prohibiting sales below cost, price discrimination laws, and similar statutes affecting marketing.

As set up, the general impression was that the WPA marketing survey's results would probably be friendly to the principle of resale price maintenance. Several members of the "monopoly committee," on the other hand, are on record as definitely opposed to this principle.

Official suspension of the economic section of the project was communicated by Hopkins to Corrington Gill, assistant administrator, in a memo, which read, in part:

"I believe the economic sections of the marketing law survey, as now set up, include studies which would appropriately be undertaken only after consideration of the scope of work of the Temporary National Economic (monopoly) committee. Furthermore, I believe that this committee should be consulted about the designation of sponsoring federal agencies, and the nature of any researches which are conducted in the field of marketing law."

Iowa Jobbers Meet March 7-9

MANCHESTER, Ia., Oct. 4.—Annual convention of the Iowa Independent Oil Jobbers Assn. has been set tentatively for March 7, 8 and 9, at Des Moines.

Salvage of Equipment; Cracking Flexibility

Discussed at Group Technical Meeting Of Western Petroleum Refiners Association

By ALLEN S. JAMES

WICHITA, Kans., Sept. 29. — Three problems that are always with refiners — flexibility in plant operations, reclaiming and utilization of refinery materials and safety — were discussed at considerable length at an all-day meeting here today of plant operators located in this section of the Mid-Continent refining area.

The meeting was sponsored by the Manufacturing Committee of the Western Petroleum Refiners Assn. and was the first of two meetings to be held this fall, the other one being scheduled for Shreveport Oct. 28. This is the third year the committee has sponsored technical meetings for plant operators in the Mid-Continent.

All three of the above problems were discussed from an economic viewpoint. The entire afternoon was devoted to a talk by Dr. Kenneth Watson of the Universal Oil Products Co., in which he showed what a modern cracking process can do in shifting percentage yields of various products to meet market conditions.

Reclaiming Methods

At the morning session E. R. Jones of the Skelly Oil Co., El Dorado, Kans., outlined various methods for reclaiming still tubes, valves, towers and waste chemicals, while Donald J. Wallace of the Sinclair Prairie Oil Co., discussed safety economics pertaining to refineries.

Dr. Watson did not have a prepared paper but discussed his subject extemporaneously. He first showed the plant operators, with the aid of blackboard diagrams, how a cracking plant could be made more flexible by the addition of coke chambers which would permit either the processing of crude down to fuel oil if the market is active for that product, or down to coke in the event the fuel oil market was sluggish and a coke market available.

The addition of the coke chambers, it was pointed out, permits an arrangement giving ultimately gasoline-coke production or gasoline-fuel oil production.

After describing the installation and operating methods for both small and large cracking units, Dr. Watson discussed percentage yields under various operating conditions, ranging all the way from high gasoline output with virtually no other useable products other than coke, to relatively low gasoline yield, relatively high yields of distillates or fuel oils and low coke production.

The speaker also touched briefly on the types of coke that can be manufactured and the various methods of coke removal.

"The practice of welding pressure still tubes," Jones told his fellow refiners, "has caused considerable thought but, as far as I have been able to find out, not a great deal has been done in this area, particularly with Cr-Mo alloy tubes. However, I understand that some refiners have had success using welded alloy tubes, welded in the field."

Salvaged Still Tubes

Jones told of the construction of a still which required shorter tubes than were used in the cracking still. Reconditioned tubes and headers were used, the tubes being cut off at each end to the proper length, and the headers were reconditioned by grinding in the plug seats and purchasing oversized plugs. The still was completely tubed with salvaged material except for the plugs, and no trouble has been experienced.

"At the Skelly refinery," Jones said, "considerable use had been made of welded carbon steel tubes for use in both low and high pressure stills. Tubes that show a wear of 50 to 55 per cent are taken out of the pressure stills. Old stubs are welded on each end and the tubes made the proper length to fit in a rerun unit operating at low pressure. In all cases, as near as possible, the stubs are the same thickness as the tube to which they are welded."

Lining a Tower

The speaker also discussed at some length the lining of towers. After describing various methods employed to line towers, Jones said that an interesting job of salvaging a tower had been done by one refiner. "The carbon steel sheets," he said, "were welded on the outside of the tower. The original sheets in the tower were riveted together in such a manner that such a job was possible without the rivets interfering.

In his discussion on reconditioning of valves, Jones said that Skelly's materials department reported that 75 per cent of the valves 2 inches and up are reconditioned. The cost of reconditioning a valve, which includes renewing stem discs and seats, will vary from 15% to 45% of the cost of a new valve.

"The disposal of spent caustic or sodium sulphide formed during the caustic washing of petroleum products to remove hydrogen sulphide is fast becoming a problem for the refiner," Jones said. "The revivification of this sodium sulphide solution into a suitable agent for removing hydrogen sulphide presents some interesting studies. Some of the methods studied were (1) contacting with flue gases, (2) blowing with air, and (3) stripping with steam."

The general discussion which followed this paper indicated the refiners were particularly interested in salvaging tubes and chemicals. Several told of their experiences, both in salvaging tubes and towers.

Safety Work Discussed

Wallace outlined in considerable detail the safety work that can be carried on in refineries and the economic value of that work. "Suppose for some cause, a still lets go," Mr. Wallace said. "Some adjacent structures are damaged, one man killed and two so injured as to require eight weeks hospitalization. Your still replacement and repair of adjacent equipment could easily cost $10,000. An additional $6000 might cover the fatality and you would be lucky if the two injured workmen cost less than $1000 more, making $17,000 as the total direct cost.

"The more indirect costs — loss of production, replacement of men, disrupted routine, etc. —could easily amount to several thousand more, but this cost is absorbed directly by your company and does not affect your insurance rate, so let's just take the $17,000 and add 30 per cent to it to cover administration costs for the insurance carrier and we have $22,100 which you have to recover before you will be in the same financial condition you were in a moment before the accident happened." Wallace referred to the record of Standard Oil Co. of Indiana, with no lost time accidents in 3,631,697 man-hours.

Wallace's suggestion that there is a possibility of electrolytic action in refinery equipment, which if it does exist would in many instances lead to weakening of pressure equipment at hidden points, developed considerable discussion. The refiners for the most part were inclined to believe there was some electrolytic action present but that tracing it down would be somewhat difficult. One refiner said his insurance department had spent two days checking on stray currents at the plant and had found so many the task had been given up.

Oil at Safety Congress

N. P. N. News Bureau

CHICAGO, Oct. 3.—Safety will continue to be the watchword throughout the industry next week as men go about their daily tasks mindful of accident's toll of death and injury, while the safety engineers responsible for such work assemble in Stevens Hotel here for the Silver Jubilee Congress of the National Safety Council.

Petroleum will have two highlights on the program. In addition to the regular meetings of the petroleum section daily during the Safety Congress Oct. 10-14, the section is sponsoring a general session Oct. 14 covering the safe use of petroleum products. Then there will be the awards in the Safety Council's fleet and passenger car safety contest, in which oil companies have taken many of the honors.

At the general session on the safe use of oil products, John T. Howell of Los Angeles, Union Oil Co. of California, will talk on, "Safety in the Handling of Volatile Liquid Petroleum Products." A demonstration will accompany this talk. Other speakers will talk on the transportation, storage, distribution and safe domestic use of liquefied petroleum gas.

An exposition of safety equipment will be held during the Congress and Oct. 12 will be petroleum section day.

The petroleum section starts off the first day with a meeting Oct. 10 at 2 p. m. A report will be given by H. W. Boggess of Tulsa, Sinclair Prairie Oil Co., chairman of the section. The address of welcome will be by Dr. M. R. Schmidt of Whiting, assistant general superintendent of Standard Oil of Indiana's Whiting refinery.

In addition to the talks before the petroleum section meetings as previously announced (see NPN, Aug. 31, page 55), a talk has been scheduled for the session Oct. 11 on "Securing the Co-operation of Independent Marketers," the speaker to be announced later. Another talk added to the program will be that Oct. 12 of C. J. Nobmann of San Francisco, manager of the safety department of the Shell Oil Co., on, "Co-operation with Local Fire Departments."

$2,000,000 Damage Award Is 'Lost' In Patent Suit

N. P. N. News Bureau

NEW YORK, Oct. 3.—The decision of the U. S. District Court for Maine, awarding $2,000,000 as damages to the Jenkins Petroleum Process Co. for alleged breach of contract by Sinclair Refining Co. was set aside, a new trial granted and the case remanded to the district court for further action, by a decision of the First Circuit Court of Appeals handed down Sept. 27.

This is the latest action in a case begun with a suit in equity filed in January, 1921, to force a specific performance of the contract, the bill being dismissed later for want of evidence. The case was taken to the district court on appeal, to be transferred to the law side.

The case grew out of a contract entered into by the Jenkins and Sinclair companies early in October, 1916, whereby a small still developed by U. S. Jenkins to operate a cracking process he developed, was to be operated at Coffeyville, Kans., by the then Cudahy Refining Co., of which W. H. Isom was president and E. W. Isom, now vice president of refining for Sinclair, was engineering assistant.

An attempt to demonstrate the Jenkins still in Chicago was unsuccessful, and it was proposed that the still should be shipped to the Coffeyville refinery of Cudahy and there operated to acquaint the Cudahy engineers with the principles and results obtained from the process. The still was set up at Coffeyville, but could not be made tight and was never operated, it was said.

Jenkins Sued

Jenkins later sued the Sinclair company, of which the old Cudahy company was now a part, claiming that a patent issued to Isom after the Jenkins process was investigated should have been assigned to Jenkins in accordance with the contract, in which it was stipulated that all improvements resulting from the knowledge of and operation of the Jenkins process should be assigned to Jenkins.

District court assumed the validity of the Isom patent in question, but the circuit court decided it was invalid, that its vertical tubes and forced circulation had been anticipated by 20 years in the prior art, notably in a patent issued to Schuchow and Gavrilow before 1900. Therefore the Circuit Court considered the Isom patent valueless and any damages to the Jenkins company purely nominal.

The improvements in process and results obtained by Isom and the Sinclair operations after the 1916 contract, the circuit court finds, were the result of the incorporation of the Bell patents' principles in the so-called Isom stills, by which continuous operation, as distinguished from batch operation, first became commercially practicable.

The balanced stuffing-box, used on the Jenkins still, was suggested to Jenkins by Isom when the still failed to operate on demonstration. This box idea was also anticipated in the art, and its use could not have been patented by Jenkins even if Isom and the Sinclair company had so assigned a patent application, it was shown.

Old in the Art

Thus, the two improvements which Jenkins claimed were the result of the Sinclair engineers familiarizing themselves with the Jenkins process, the vertical tubes and balanced stuffing-box, were old in the art and not patentable, the court stated. Sinclair obtained improved results because of the Isom patent, which was anticipated, and the Bell patents. "We think there is no evidence in the record from which the jury was warranted in drawing the inference that E. W. Isom appropriated any of Jenkins' ideas or made any improvements in his apparatus as a result of this letter-contract," the appeals court stated. "Taking all the evidence in its most favorable aspect for the plaintiff, we think there is no support in the record for the verdict."

The Sinclair also was granted recovery of the costs of appeal by the Circuit Court. What action in the district court may follow this reversal has not been announced.

'Gas' Tax Conference Lists Program For Tulsa Meeting

TULSA, Oct. 3.—Discussions of diesel fuel tax, alcohol blends, refunds and exemptions have been included in the program for the annual meeting of the North American Gasoline Tax Conference, to be held in Tulsa, October 10, 11, 12 and 13. The organization's membership is composed of officials responsible for the state gasoline tax collections in the various states.

President H. P. Leatham, who is revenue commissioner for Utah, in announcing the program stated that a delegation from Canada would attend this year, and that a member of the delegation would discuss Canadian gasoline tax problems.

The program in full follows:

Monday, Oct. 10

Welcoming address, Gov. E. W. Marland of Oklahoma.

Response, President H. P. Leatham.

Address by Carl Barker, Shell Petroleum Corp., St. Louis, Mo.

"Surety Bonds," Charles C. Conlon, vice president of the U. S. Fidelity and Guaranty Co.

"Diesel Fuel Tax," Joseph D. Hadley of Michigan, and Dixwell L. Pierce of California.

"Alcohol Blends," Arnold R. Daum, Chicago.

Tuesday, Oct. 11.

Addresses by John Bingaman of New Mexico, George Sheppard of Texas and A. J. Maxwell of North Carolina.

"Retail Station Control," Joseph L. McLaughlin of New Jersey, past president of the Conference.

"Joint Audits," L. R. Edwards of Utah.

"Field Checking," C. F. Joyner Jr. of Virginia.

"Continuous Audits," Arthur Pugh of Wisconsin.

Wednesday, Oct. 12

"Nebraska Motor Vehicle Fuel Tax Law," E. A. Dosek of Nebraska.

"Tax Administration and Industry," Gen. Baird H. Markham of the American Petroleum Industries Committee.

"Problems of Highway Users," Chester H. Gray, director of the National Highway Users Conference.

"Canadian Gasoline Tax Problems," Philippe Gimaiel, Quebec.

"Refunds vs. Exemptions," C. C. Brown, Oklahoma Tax Commission.

General discussion led by E. D. Graham of Oklahoma, and chairman of the executive committee of the organization.

Thursday, Oct. 13

Unfinished business, reports of committees and election of officers.

Meeting in the heart of the Mid-Continent oil producing territory, an extensive entertainment program has been developed by a committee composed of representatives of the oil industry. The local committee is composed of H. B. Latting, chairman, Skelly Oil Co.; F. W. Alexander, Phillips Petroleum Co., Bartlesville; W. Leo Austin, Mid-Continent Petroleum Corp., E. H. Balch, Barnsdall Oil Corp.; George H. Bowen, Sun Oil Co.; O. C. Cash, Stanolind Oil & Gas Co.; Dan D. Harley, The Ohio Oil Co.; J. H. Hill, The Texas Co.; J. A. McNeese, Continental Oil Co., Ponca City; G. E. Thompson, Tide Water Associated Oil Co.; J. C. Wallingford, Amerada Petroleum Corp.; John W. Campbell, Mid-Continent Oil & Gas Assn.; and W. K. Carr, Oklahoma Petroleum Industries Committee.

The committee has arranged for an automobile tour for the ladies of the historical sites in eastern Oklahoma, for a trip through the Mid-Continent Petroleum Corp.'s refinery in West Tulsa for both the men and the women, and for a barbecue picnic for the men and women at Woolaroc Ranch in the Osage Indian nation.

Complaint Charges Crude From Mexico 'Dumped' In Texas

WASHINGTON, Oct. 3.—Customs Bureau officials revealed today that they are investigating a complaint of "dumping" of Mexican oil through the port of Houston.

While the Bureau would not make the name of the complainants known, it has been learned here that the North Texas Oil & Gas Assn. has determined to file a complaint on alleged dumping of crude, under the antidumping act of 1921.

The North Texas Assn., according to word reaching here, charged that 300,000 barrels of Mexican crude were landed at Houston during August and September, bringing a price of $1.01 per barrel.

The antidumping law prohibits sale of any imported commodity in this country at a price below that which it brings in the country of origin.

Distillation Conference

PHILADELPHIA, Oct. 3.—Petroleum Distillation Corp. on Oct. 17 and 18 will hold its third co-operative technical meeting for discussion, among representatives of the participating companies and its licensees, of practical and theoretical aspects and problems of distillation as applied to the petroleum industry, Dr. T. G. Delbridge, president of the company announced.

The company is licensor of the distillation patents of the Atlantic Refining Co., Standard Oil Co. of New Jersey, The Texas Co. and Standard Oil Co. of Indiana, its owner companies, and of Gulf, Socony-Vacuum and Standard Oil Co. of California, its present licensees.

Drilled Oil Reserves Are Now At All-Time Peak

Geologist Reports To Gov. Marland

Undrilled Reserves Are At Low Ebb

TULSA, Oct. 1.—Crude oil reserves in known fields on Sept. 1, 1938 totaled 13,584,000,000. barrels, it was estimated by Alex W. McCoy, consulting geologist, Ponca City, in a report prepared for Gov E. W. Marland, Oklahoma and released at the meeting of the Interstate Oil Compact Commission, Sept. 29.

McCoy prepared a similar report early this year for the Marland conference in Hot Springs last January. He then estimated reserves as of Jan. 1, 1938, at 12,909,000,000 barrels.

Total reserves in McCoy's latest report are divided as follows:

State	Barrels
California	2,970,000,000
Rocky Mt. States	
Wyoming	247,000,000
Montana	72,000,000
Colorado	19,000,000
Central and Southern	
New Mexico	445,000,000
Texas	6,200,000,000
Oklahoma	1,416,000,000
Kansas	648,000,000
Louisiana	644,000,000
Arkansas	177,000,000
Eastern	
Illinois	200,000,000
Indiana (old Illinois)	12,000,000
Kentucky	45,000,000
Michigan	75,000,000
New York	60,000,000
Ohio	34,000,000
Pennsylvania	290,000,000
West Virginia	30,000,000
Total	13,584,000,000

The report contained numerous tables and charts relating to supply, demand and price. The author's summary is as follows:

"1. The total known or proved reserve of crude oil in the United States as of Sept. 1, 1938, is estimated at approximately 13,500,000,000 barrels.

"2. Of this reserve, 10,300,000,000 barrels are drilled or developed at the present time; 3,200,000,000 barrels of this reserve are known but not developed. This is an all-time peak of drilled reserves. The known but undrilled reserve today is lower in actual barrels than at any time since 1919. It probably represents the lowest ebb in petroleum history of known but undrilled reserves as compared to demand, approximately only a two and one-half years' supply.

"3. The total demand for crude oil in the United States for the next 20 years is estimated at approximately 34,000,000,000 barrels. The total amount produced to date is approximately 20,600,000,000 barrels. The total amount discovered to date is estimated at approximately 34,100,000,000 barrels.

"4. In order to meet expected demand during the next 20 years, it is necessary, in addition to the production from the known reserve, to discover 28,000,000,000 barrels of new oil. This rate of discovery equals the rate of discovery in the United States since 1924. Discovery rates have declined over 50 per cent during the last seven years as compared with discovery rates from 1924-1930 inclusive. Discovery since 1930 has not equaled demand.

Per-Barrel Discovery Cost

"5. The average total cost of the industry for delivering one barrel of oil to the pipeline, considering all investment with interest, is estimated as follows:

(a) for oil discovered between 1924 and 1938 ...$1.11

(b) for oil necessary to be discovered during the next 20-year period $1.89

"6. Considering no additional development, present drilled reserves are estimated to be capable of supplying all demand until July, 1942. The present drilled reserve will continue to produce after that date, but thereafter its ability to produce daily is estimated to be less than the total daily demand.

"7. The petroleum industry is operating under a present overproduction, constantly growing more menacing by excess drilling in spite of a limited reserve for an adequate future supply. For 10 years proration has successfully withheld excess oil from the market, allowed the reduction of crude stocks above ground, and helped to maintain a reasonable uniformity in crude prices. It has caused a great increase in the drilled reserve since each producing unit is forced to develop larger potential producing ability in order to hold its relative market position. Excess drilling increases the drilled and reduces the undrilled portion of the reserves. By continuing to increase the drilled portion of the reserve, the daily ability of the industry to produce is constantly held above a reasonable level in relation to demand;—allowables must continue to be reduced, and pay-outs become of longer term. *Some solution of this critical problem is necessary during the next few years to avert a destructive adjustment in an essential industry.*

"8. Discoveries necessary during the next five years in order to balance supply and demand in 1945—6,000,000,000 barrels. This discovery should be added to the undrilled portion of the reserve and withheld from immediate development."

In another portion of the report McCoy remarked:

"The oil industry and the public are living in a Fool's Paradise. The industry is struggling under an overproduction constantly becoming more menacing through excess drilling while making an effort to balance budgets and show profits. The public is enjoying motor fuel and lubrication at a cost undervalued in relation to other commodity prices. Government agencies have taken advantage of this low price to levy high ratios of taxation. Ten years hence, the industry may actually face a shortage in supply, and obsolescence of equipment; the public, heavily equipped to use petroleum products, be required to pay dearly for them, and the government agencies placed in a dilemma for a new source of tax revenues because of forced reductions in this field under increased prices for a necessity.

'Some solution of this critical problem is necessary during the next two or three years to avert a destructive adjustment in an essential industry so that the evolution of a future balanced economy may result to the greater benefit for all."

McCoy estimates the total cost of finding, drilling and 18,000,000,000 barrels between 1925 and 1937, inclusive, as $11,192,000,000, without considering interest or lifting costs. When that total amount found in the 1925-1937 period shall have been produced, another $6,750,000,000 will have gone into producing expense, again not including interest on investment, making a grand total of $17,942,000,000 to find, develop and produce the 18,000,000,000 barrels. The average per barrel of 99 cents—$1.11 considering interest at 12 per cent gross—is held down by the East Texas figure of lifting costs of an average of 25.7 cents per barrel assigned to 3,500,000,000 barrels.

Discovery Cost to Increase

In the next 20 years—1939-1958 inclusive, McCoy foresees a sharp rise in costs, despite improvement in drilling and producing technique. This will occur, he says, because cost of discovery is going to be greater. There will be 34,000,000,000 barrels required and 28,000,000,000 barrels still await discovery or development, of which 22,300,000,000 barrels will be produced and this will be supplemented by 11,700,000,000 barrels of his present reserve of 13,584,000,000 barrels—not all of the present reserve can be taken out in the 20 year-period. The total estimated cost of finding and producing the new crop he places at $1.89 per barrel, including interest, and the cost including the production from more cheaply discovered reserves prior to 1939 is estimated at $1.62 per barrel.

Discovered in 1938 to Sept. 1 were the following amounts, McCoy estimates:

California	70,000,000
Wyoming	3,000,000
Montana	2,000,000
New Mexico	25,00,000
Texas	200,000,000
Oklahoma	30,000,000
Kansas	35,000,000
Louisiana	50,000,000
Arkansas	10,000,000

McCoy did not give any estimate of the 1938 discoveries in states east of the Mississippi River, including Illinois and Michigan.

McCoy's Estimates Are Below A. P. I. Figures

CLEVELAND, Oct. 3.—Geologist McCoy's estimate for Governor Marland that crude oil reserves in known fields on Sept. 1, 1938, totaled 13,584,000,000 barrels was 2,000,000,000 barrels below the estimate of 15,507,268,000 barrels as of Jan. 1, 1938, compiled by the American Petroleum Institute. Principal difference in the estimates was that the A. P. I. gave Texas 8,247,928,000 barrels as compared with McCoy's figure of 6,200,000,000 barrels. (See NPN Feb. 16, 1938, for A. P. I. estimates.)

Settle Texas Anti Trust Case

(*Continued from page* 5)

Jersey, Standard Oil Co. of New York, Standard Oil Co. of California, Shell Union Oil Corp., Humble Oil and Refining Co., The Texas Co., Gulf Refining Co., Pasotex Petroleum Co., Continental Oil Co., Sinclair Refining Co., Magnolia Petroleum Co., Simms Oil Co., Shell Petroleum Corp., Cities Service Oil Co., Texas Pacific Coal and Oil Co., American Petroleum Institute and Texas Petroleum Marketers Assn.

The decree entered by the court today asserts the innocence of all defendants except the marketers association. The charter of this organization is still alive, although it had not functioned in recent years.

The judgment sets out that $425,000 of the agreed penalty imposed on the marketers association goes to the state. The other $25,000 is divided among three attorneys specially retained by the state.

Stored Crude Found As Good as Today's

N. P. N. News Bureau

WASHINGTON, Oct. 1.—The oil industry should carry about 205,000,000 barrels of net refinable crude oil in storage, to meet contingencies, in the estimation of the U. S. Bureau of Mines. This figure would fluctuate to some extent in inverse ratio to other than seasonal changes in stocks of refined products.

Actual refinable crude oil stocks on Sept. 17 were 280,945,000 barrels, according to the current statistical report of the Bureau of Mines, after having been reduced by about 25,000,000 barrels since the first of this year.

The figure for what might be termed proper economic working stocks is contained, along with a great deal of other data on both quantity and quality of crude oil in storage in this country, in the final report of the Bureau of Mines on its survey of crude in storage for 1936-37.

This survey was made at the request of the Interstate Oil Compact Commission and other groups interested in forecasting petroleum demand and Congress appropriated special funds for conducting the survey during the fiscal year ending June 30, 1937.

It had been contended by many agencies that it was not known how much crude the industry actually had in storage, that the figures on stocks were entirely estimates and that also much of the crude oil in storage had been there for so long a period that it had lost much of its gasoline content through evaporation and loss of the light fractions of the crude.

Quality Is High

As to the quality of the crude oil in storage, the report brings out that the average quality of the stored oil closely approximates that of current production. The reason assigned for this is that a large part of the older crude oil in storage was originally flush production from fields that produced high-grade oil and the original quality of these oils offset the deterioration from evaporation losses, and the progressive improvement in storage tank construction has reduced the rate of such losses materially in current years. In the course of the survey some 1500 samples of crude oil in storage were tested.

As regards the volume of crude oil in storage, the figure given in the survey of about 287,000,000 barrels as of Jan. 31, 1937, agrees with the estimates the Bureau of Mines had been reporting regularly, and with the estimate of the American Petroleum Institute for the same date. The survey gave a "high" for crude oil stocks in this country of about 434,000,000 barrels in the latter part of 1929.

The definition of crude oil stocks as used in the survey is that generally used in the industry, that is "net refinable" stocks. About 30,000,000 barrels of bottom sediment were excluded and about 65,000,000 barrels of heavy crude and fuel oil stored in California. This latter amount some time previously had been set aside by the Bureau of Mines from stocks of refinable crude. Stocks of crude oil of foreign origin were included.

Lease Stocks Excluded

Lease stocks were disregarded, they are believed to amount to only about three per cent of total crude stocks and it was not found possible, in this survey, to make an adequate survey of the thousands of small tanks used at the wells. The survey was made through special forms with questions sent to companies holding 100,000 barrels or more of crude in storage, as indicated in the regular monthly reports made to the Bureau of Mines.

In setting up its figure of about 205,000,000 barrels as proper stocks for the industry to carry, the survey showed that approximately 105,000,000 barrels of minimum working stocks were divided as follows:

1—About 11,000,000 barrels represented accumulations on leases to maintain an adequate supply for delivery to gathering lines.

2—About 43,000,000 barrels of the 50,000,000 barrels held by pipeline companies, divided into (a) 21,000,000 barrels actually contained in gathering and truck pipelines, (b) about 12,000,000 barrels contained in minimum working tanks for main trunk line operations, (c) about 10,000,000 barrels of essential terminal storage out of the 17,000,000 barrels of tank storage at gathering line terminals, main line transshipment points and main line terminals.

3—An average of about 4,000,000 barrels in transit to domestic refineries by barge or tank ship.

4—Approximately 47,000,000 barrels at refineries, representing a minimum safety factor of about two weeks' supply.

Taking into consideration the characteristics of petroleum operations and the organization of the industry, the Bureau of Mines said, in its survey, that it was probably necessary to have at least 100,000,000 barrels of contingent reserves above ground, in addition to the 105,000,000 barrels of true working stocks, to meet all of the industry's varied needs.

"Although this survey indicates that a minimum of stocks ranging from 200,000,000 to 250,000,000 barrels is needed," said the report, "no exact level of crude oil stocks can be fixed without a detailed analysis of individual company positions and policy and without more accurate information than is now available concerning potential reserves and the extent to which a program of underground storage has replaced above ground storage. Without such information, a considerable factor of safety in stocks undoubtedly is necessary in an industry in which production and demand are subject to such rapid change."

In discussing crude stocks by age groups, the survey reported that, of total stocks of over 311,000,000 barrels of refinable oil on June 30, 1936, current stocks—that is oil stored in 1936—were about 194,000,000 barrels, or 62 per cent of all oil in storage. The next largest age group consisted of about 51,000,000 barrels of oil stored from 1931 to 1935, or 16 per cent of the total. "Primarily because one large accumulation of oil stored before 1925 had not been liquidated extensively, total stocks in that age group exceeded the total in the next oldest group, representing oil stored in the period 1925 to 1930," said the survey. (See accompanying table.)

"The weighted average age of all the stocks on June 30, 1936, was about three years."

As regards the quality of the crude oil in storage, the survey reported that its results of sampling and Hempel distillation analysis indicated that the average quality of the stored oil closely approximates that of current production.

Original Quality High

"The reason is that a large part of the older crude oil in storage was flush production from fields that produced high-grade oil," the report stated. "The original superior quality of these oils has offset the deterioration from evaporation losses and progressive improvement in storage tank construc-

Stocks of Crude Petroleum, June 30, 1936, by Age Groups, by States of Origin

(Figures in Millions of Barrels)

State of Origin	Stored before 1925	Stored 1925–30	Stored 1931–35	Stored 1936	Total
California	....	2.4	7.0	28.5	37.9
Texas	1.1	10.7	15.6	81.1	108.5
Oklahoma	14.6	9.8	19.9	43.5	87.8
Louisiana	1.4	....	0.1	10.8	12.3
New Mexico	....	....	0.4	5.7	6.1
Kansas	....	0.1	0.5	5.2	5.8
Arkansas	0.6	0.4	0.4	3.7	5.1
Other States	21.3	4.3	6.9	12.7	45.2
Foreign	....	....	....	2.6	2.6
Total	39.0	27.7	50.8	193.8	311.3

Distillate Recoverable from Crude Oil in Storage in U. S. on June 30, 1936

(As reported by the U. S. Bureau of Mines)

Time of initial storage Prior to	Crude oil Net stocks, in millions of barrels	°A.P.I.	Distillation loss, percent	Distillate recoverable[1] Below 212° F. (100° C.) Millions of barrels	Percent	°A.P.I.	Below 392° F. (200° C.) Millions of barrels	Percent	°A.P.I.
1925	39.0	32.2	0.6	1.361	3.5	68.1	8.709	22.3	54.4
1925-30	27.7	32.4	.8	1.875	6.8	74.4	7.513	27.1	58.2
1931-35	50.8	32.6	1.2	3.513	6.9	72.4	13.241	26.1	57.6
1936	193.8	32.8	1.7	14.424	7.4	74.1	51.935	26.8	57.4
	311.3	32.7	1.4	21.173	6.8	73.6	81.398	26.1	57.2

[1]Not including distillation loss.

tion has reduced the rate of such losses materially in recent years."

"The growth in demand for heating oils and diesel oils has been greater, relatively, than the rate of increase in gasoline demand. However, as the age of the crude oil generally has little effect on fuel oil yields, the older stored oils may be used to produce heating oils and diesel oils and thus release current production for the manufacture of gasoline.

"In other words, the oil now in storage can meet the combined demand for gasoline and light fuel oil almost as well as an equal volume of the average oil from current production."

In discussing the effect of evaporation losses on oil in storage, the survey points out that such loss decreases both the quantity and quality of straight-run gasoline but has no marked effect on gasoline that can be recovered by cracking the residue from which the straight-run distillate has been removed, nor does it seriously handicap the manufacture of other products, such as heating oils and lubricants. Regarding the cracking possibilities of crude held in storage, the report stated:

"The major portion of the stocks is held by companies that operate cracking units, so that, when the oil eventually is processed, the gasoline yield will be considerably more than the 26.1 per cent of light distillate (below 392 F.) recovered from the samples.

"Just how much higher is a matter of conjecture, but, considering that the few large companies holding most of the older stocks crack much more extensively than the average, it is reasonable to suppose that the eventual gasoline yield from the oil in storage on June 30, 1936, will exceed 44.1 per cent, which was the actual average for all crude oil refined in the U. S. in 1936."

Distillate Fractions

The weighted-average indicated yield for the fractions of crude oil in storage as analyzed, distilling below 392 F. was 26.1 per cent for the samples representing the 311,000,000 barrels of oil in storage June 30, 1936, the Bureau of Mines reported. For the samples representing the 194,000,000 barrels of current oil (stored in the first half of 1936) the fractions distilling below 392 F. comprised 26.8 per cent of the crude oil, it stated.

While the fraction distilling below 392 F., if distilled from some crudes, might be used without additional processing as third-grade gasoline, the report stated, in general the analyses showed the few of the 1500 crude oils sampled would yield straight-run products that could be sold on the open market as regular grade gasolines without treatment or blending.

"Distillates recovered from most of the oils would require chemical treatment and the addition of natural gasoline or tetra-ethyl lead, or both, to meet the requirements for regular grade gasoline," the report stated. "However, the percentage of distillate recovered below 392 F. may be selected as the closest approach to the percentage of straight-run gasoline commercially recoverable from the average crude oil that can be obtained by a convenient and generally recognized method of laboratory distillation." This fraction was said to approximate the amount of material in the crude oil having a maximum boiling point of about 419 F.

Total capacity of storage tanks for crude on June 30, 1936, was listed as 583,478,000 barrels in the report, exclusive of tanks for lease stocks and tanks used in California for the storage of heavy crude and fuel oil. This was said to represent a decline of 6 per cent from the total of 620,505,000 barrels in the U. S. on May 1, 1931. The total number of crude oil tanks was said to have declined in the same period from 16,342 to 15,094. The survey showed that, by 1936, about 99.5 of storage capacity was in the form of steel tanks and only one-half per cent was wood, concrete or earthen storage.

'Gas' Prices Cut In Eastern Areas

NEW YORK, Oct. 1.—Effective September 30, Standard Oil Co. of New Jersey reduced its tank wagon and consumer tank car prices of regular and premium grades of gasoline 0.5 cent throughout West Virginia, North Carolina, South Carolina, Maryland, except the eastern shore, and the District of Columbia, according to a company announcement.

On the same day, Standard Oil Co. of Louisiana reduced its tank wagon and consumer tank car prices of regular and premium grades 0.5 cent through Arkansas, Tennessee and Louisiana.

Spot tank car gasoline prices posted by the Jersey company also were reduced 0.5 cent at Wilmington, North Carolina and Charleston, South Carolina on the same date.

The reductions, which did not affect third grade gasoline, were due, the company stated, to "reductions in primary gasoline markets."

Pennsylvania Grade Lube Inventories Ignore Calendar and Continue to Drop

N. P. N. News Bureau

WASHINGTON, Oct. 4. — Inventories of the more important Pennsylvania lube items, except 180 vis. and above neutral oil, continued to decline in the seven-day period ended Sept. 29, according to report of the National Petroleum Association today.

The lower viscosity viscous neutrals decreased 649,882 gallons; bright stock, 197,878 gallons; and 600 steam refined, 132,594 gallons. The higher viscosity neutrals increased 84,871 gallons.

Stocks of all of the major products on Sept. 29 were substantially lower than stocks reported by the association as of Sept. 30, 1937, the nearest comparable date last year. Inventories of 600 steam refined were 2,073,999 gallons lower; bright stock, 905,883 gallons; 180 vis. and above neutral, 692,343 gallons; and 142-180 vis. neutrals, 603,458 gallons lower.

Comparison of inventories as compiled by the N. P. A. from reports of all companies which refined Pennsylvania crude oil, follows:

	Sept. 22, 1938 Gallons	Sept. 29, 1938 Gallons	Sept. 30, 1937 Gallons
1. Raw Long Residuum (Including all raw long residuum below, and not salable, as 600 fire)	2,568,093	3,192,784	1,180,694
2. Steam Refined (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	8,953,269	8,820,675	10,894,674
3. Other Steam Refined (Not included in 1 and 2 above)	6,002,050	5,835,753	3,712,332
4. Finished Dewaxed Long Res.	2,097,994	2,167,429	2,797,524
5. Bright Stock (Does not include any material reported in 4, above)	14,598,731	14,400,853	15,306,736
6. Viscous Neutral, below 180 vis. but not below 142 vis. @ 100	5,947,701	5,297,819	6,901,277
7. Viscous Neutral, 180 vis. @ 100 and above	7,682,326	7,767,197	8,459,540

Kerosine Advanced in Ohio

CLEVELAND, Oct. 4.—Effective Oct. 1, Standard Oil Co. of Ohio advanced its posted tank car prices for kerosine 0.05 cent, except in its lowest freight rate area where the advance was 0.125 cent. Its new prices are:

Where full freight rate from Toledo does not exceed 0.62 cent per gallon, delivered price is 6.125 cents; and the following:

Where full freight is:	Price is, f.o.b. Toledo
0.63 to 1.15c	5.50c
1.16 to 1.25c	5.45c
1.26 to 1.35c	5.40c
1.36 to 1.45c	5.35c

Last previous change on kerosine was an advance of from 0.125 to 0.2 cent, Aug. 22.

Crude Stocks Drop 21,000,000 Barrels In 4-Month Period

WASHINGTON, Oct. 3.—A decrease of 667,000 barrels during the week ending Sept. 24 brought stocks of crude petroleum to 280,278,000 barrels on that date, Bureau of Mines reported today.

Crude stocks have dropped more than 21,000,000 barrels since May 28. Crude of Oklahoma origin has accounted for more than 13,000,000 barrels of the total decrease in the last four months.

Stocks by grade or origin, showing changes, are shown in box below:

Grade or origin	May 28	Sept. 17	Sept. 24	Change from Sept. 17
Pennsylvania Grade	5,694	6,243	6,266	+ 23
Other Appalachian	1,348	1,352	1,321	— 31
Lima-Michigan	1,529	1,187	1,221	+ 34
Illinois-S. W. Indiana	10,297	11,023	11,033	+ 10
Arkansas	4,133	2,990	3,066	+ 76
Kansas	5,952	6,252	6,206	— 46
Louisiana:	12,553	13,885	14,012	+127
Northern	(1)	6,078	6,123	+ 45
Gulf Coast	(1)	7,807	7,889	+ 82
New Mexico	8,786	7,409	7,458	+ 49
Oklahoma	90,567	77,760	77,151	—609
Texas:	105,228	95,576	94,647	—929
East Texas	(1)	22,629	22,438	—191
West Texas	(1)	17,928	18,048	+120
Gulf Coast	(1)	20,183	19,677	—506
Other Texas	(1)	34,836	34,484	—352
Rocky Mountain	24,157	21,730	21,609	—121
California	32,050	32,853	33,745	+892
Foreign	3,378	2,685	2,543	—142
Total U. S. refinable	301,583	280,945	280,278	—667
Heavy in Calif.	(1)	17,313	17,280	— 33

(1) Not available.

Position of Oil Industry Today—

	Oct. 1	Sept. 24	Oct. 2, '37
Crude Production (bbls. daily)	3,231,800	3,251,000	3,647,450
Crude Imports (bbls. daily)	57,000	39,957	80,570
Crude Run to Stills (bbls. daily)	3,235,000	3,220,000	3,450,000
Gasoline Production (bbls. week)	9,573,000	9,613,000	.....
Gasoline Stocks (bbls. total)	68,602,000	68,605,000	65,466,000
Gas & Fuel Oil Stocks (bbls. total)	151,759,000	150,468,000	116,164,000

Latest Crude Oil Production, Important Districts, Total U. S.

(*American Petroleum Institute figures*)

	Week Ended Oct. 1 Barrels	Sept. 24 Barrels	Aug. 27 Barrels
Oklahoma City	95,200	92,100	96,750
Total Oklahoma	454,050	448,300	437,050
Kansas	159,400	161,100	165,350
East Texas	369,000	369,000	441,200
Total Texas	1,236,300	1,224,450	1,395,150
Total Louisiana	260,600	265,400	267,300
Illinois (New pools)	77,700	74,600	59,600
California	655,400	674,800	674,000
East of Rockies	2,576,400	2,576,350	2,714,500
Total U. S.	3,231,800	3,251,150	3,388,500
Crude Imports	57,000	38,850	66,000
Total New Supply	3,288,800	3,290,000	3,454,500

Decline In 'Gas' Stocks Slows Down To A Trickle

N. P. N. News Bureau

NEW YORK, Oct. 4. — Gasoline stocks in the U. S. on Oct. 1 totaled 68,602,000 barrels, down only 3000 barrels from the end of the previous week, report of the American Petroleum Institute today showed.

Inventories of gas oils and fuel oils continued to soar, rising 1,291,000 barrels to 151,759,000 barrels, the Institute's report also showed. Crude runs for the country as a whole were increased 15,000 barrels on daily average while gasoline production at plants reporting to the Institute was down 40,000 barrels.

Last March, Fred Van Covern, director of the Institute's Department of Statistics, in discussing the economics of the oil industry's inventory situation, had estimated that "minimum requirements" in gasoline stocks as of Sept. 30 would be 62,000,000 barrels for the entire country. Stocks on Oct. 1, as reported by the Institute, were 6,602,000 barrels, or 9.62 per cent, above this level.

Gasoline production last week was lower in amounts ranging from 6000 barrels to 96,000 barrels in six of the 10 refinery districts reporting to the Institute. There was an increase of 119,000 barrels in the East Coast district, however, and smaller increases in California and the Indiana - Illinois - Kentucky and North Louisiana-Arkansas districts which pared down the total decline to 40,000 barrels.

With stocks declining only 3000 barrels last week, indicated excess of production to demand was 37,000 barrels. In the comparable seven-day period last year, 189,000 barrels of gasoline were taken from storage.

The industry enters the 1938-1939 domestic heating oil season with nearly 5,000,000-barrels more of gas oils and distillates in storage than at this time last year. Inventories of these oils increased 431,000 barrels to 31,614,000 barrels in the week ended Oct. 1. The East Coast district and California accounted for more than two-thirds of this inventory increase.

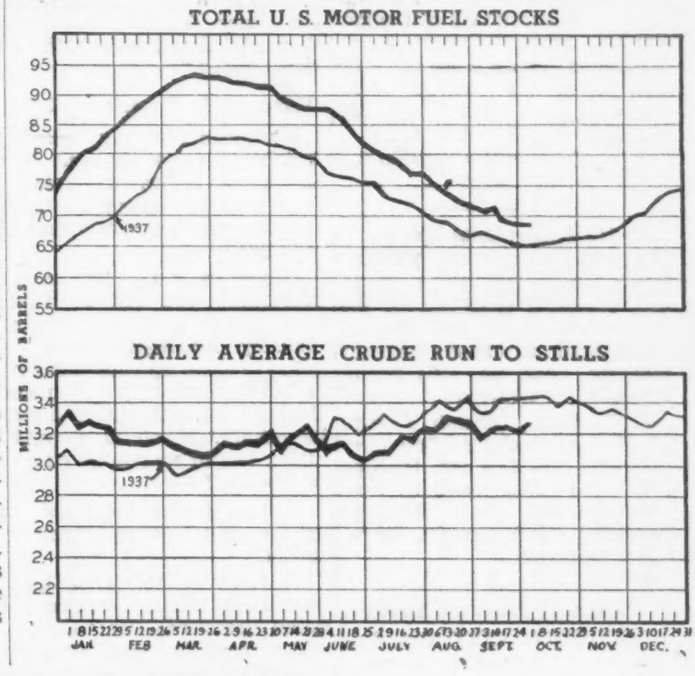
The disparity between stocks of heavy fuel oils this year and last, is even greater. Inventories totaled 120,145,000 barrels on Oct. 1, more than 31,000,000 barrels above inventories on the same 1937 date. Stocks increased 860,000 barrels last week with California alone accounting for nearly two-thirds of this increase.

Crude Price Changes

FINDLAY, O.—Effective Sept. 27 The Ohio Oil Co. reduced Illinois, Indiana and western Kentucky crude 10 cents, to new prices of $1.25 for Illinois, Illinois Basin, and Princeton, (Ind.); and $1.20 for Owensboro, western Kentucky.

This reduction was met by other large purchasers, including Fordsville Gathering Line, Inc. in Kentucky, and Owensboro Corp. in Illinois, both Standard of Ohio subsidiaries; Ashland Oil & Transportation Co. in Kentucky; and Carter Oil Co., Standard of New Jersey subsidiary, in Illinois.

CLEVELAND—Effective Sept. 27 Fordsville reduced Owensboro, Ky. district 10 cents and Birk City 5 cents, making new prices for both $1.20 per barrel at the well. On the same date Owensboro reduced eastern Illinois crude 10 cents, making new price for Beecher City $1.25. On Oct. 1, Owensboro advanced crude in the Centralia, Ill. con-



CURRENT REFINERY OPERATIONS

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills Week Ended Oct. 1	Sept. 24	Per Cent of Reporting Capacity Operated Week Ended Oct. 1	Sept. 24	(a) Gasoline Production Week Ended Oct. 1	Sept. 24	Stocks Total Finished and Unfinished Motor Fuel(b) Week Ended Oct. 1	Sept. 24	Stocks of Gas and Fuel Oil Gas Oil and Distillates Week Ended Oct. 1	Sept. 24	Residual Fuel Oil Week Ended Oct. 1	Sept. 24	Total Week Ended Oct. 1	Sept. 24
East Coast	100.0	515	476	83.7	77.4	1,408	1,289	18,328	18,510	7,305	7,169	8,683	8,512	15,988	15,681
Appalachian	85.9	102	103	79.7	80.5	350	376	2,920	2,935	234	234	680	709	914	943
Ind., Ill., Ky.	89.0	461	440	94.9	90.5	1,911	1,900	10,551	10,381	3,721	3,727	5,657	5,673	9,378	9,400
Okla., Kans., Mo.	81.6	256	267	74.9	78.1	961	1,057	5,909	5,995	1,271	1,203	3,316	3,328	4,587	4,531
Inland Texas	50.3	104	106	65.4	66.7	430	479	1,606	1,643	372	375	1,633	1,654	2,005	2,029
Texas Gulf	88.9	758	780	90.5	93.1	2,456	2,462	9,812	9,934	5,840	5,838	8,411	8,226	14,251	14,064
La. Gulf	97.3	109	112	75.2	77.2	287	300	2,240	2,075	1,096	1,053	2,128	2,114	3,224	3,167
No. La., Ark.	55.0	35	36	63.6	65.5	103	96	499	549	252	277	560	578	812	855
Rocky Mt.	54.2	50	49	78.1	76.6	197	206	1,111	1,154	136	122	699	694	835	816
California	90.0	508	512	68.2	68.7	1,470	1,448	12,086	11,889	10,657	10,465	85,818	85,307	96,475	95,772
Total Reporting	85.5	2,898	2,881	81.0	80.5	9,573	9,613	65,062	65,065	30,884	30,463	117,585	116,795	148,469	147,258
Estimated U. S. Total (Bur. of Mines)		3,235	3,220					68,602	68,605	31,614	31,183	120,145	119,285	151,759	150,468

(a) Includes straight-run, cracked, and natural blended.
(b) Includes stocks at refineries, in bulk terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.

gested district 5 cents, to new price of $1.15 per barrel. The area outside the congested district was unchanged from $1.25.

TULSA — Effective Sept. 29 Carter Oil Co. reduced Loudon area, Fayette county, Ill. crude 10 cents, to new price of $1.25 per barrel.

ASHLAND, KY. — Effective Oct. 1 Ashland Oil & Transportation Co. reduced Somerset, Ky. grades of crude in Ashland lines, 10 cents, making new prices $1.22 for Big Sandy River production, and $1.30 for Kentucky River production.

MT. PLEASANT, MICH.—Effective Oct. 1 Simrall Corp. reduced its prices for Michigan crudes from 6 to 9.5 cents per barrel, making new prices: Crystal, Greendale and Porter, $1.025 per barrel; Beaverton, Bentley, Buckeye, Edenville and Freeman, $1.00; and Arenac and West Branch, $0.84 per barrel. The two former groups were cut 9.5 cents; the latter group, 6 cents.

SHREVEPORT — Effective Oct. 1 Caddo Crude Oil Purchasing Corp., subsidiary of Grogan Oil Co., reduced Lisbon, North Louisiana, crude 5 cents. Its new prices are: $0.83 for below 34 gravity oil; $0.85 for 34-34.9; and $0.87 for 35 and above.

Last previous change was a 6 to 10 cent cut, Sept. 20.

Oil Accountants Elect

TULSA, Oct. 1.—J. M. Flaherty, Shell Petroleum Corp., was reelected president of the Petroleum Accountants Society of Oklahoma at the annual meeting, Sept. 29. This began the society's tenth year.

R. L. Rush, Sinclair Prairie Oil Co., was reelected first vice-president, R. E. Parr, Phillips Petroleum Co., second vice-president and M. H. Massey, Stanolind Oil & Gas Co., secretary-treasurer.

Missouri Jobbers To Meet

JEFFERSON CITY, Oct. 3.—The annual convention and trade exhibit of the Missouri Independent Oil Jobbers Assn. will be held Jan. 18 and 19 at the De-Soto hotel in St. Louis, Robert W. Hadlick, secretary, announced.

P. B. Flynn Dies

CHICAGO, Oct. 3. — P. B. Flynn, president of Calumet Refining Co. and Red River Refining Co. died suddenly Friday evening at Wichita Falls, Texas, having been operated on a week ago for appendicitis. He was general manager of the Reno Oil Co. at Wichita Falls, Texas and a very well known oil man, particularly in the Southwest. Interment was at Mounds, Okla.

Oil Advisory Board Urged by Retailers

(*Continued from page* 9)

of promises, these proposals seem to fall on receptive ears within the industry. One has but to study the results of the various federal and state investigations and the utter lack of any constructive accomplishments to see that these proposals are made by power seeking and power drunk office holders attempting to foist a communistic system on the American people.

"Let anyone who advocates public control look at the railroads. Practically every American railroad is headed for bankruptcy because of government control. We believe the petroleum industry's record is the best argument for free enterprise.

"This committee strongly recommends that before any state or local group proposes or advocates legislation of any type or before the communication with any federal department they advise and consult the national office."

Wisconsin's Experience Cited

Wisconsin formerly looked to legislative remedies, said John E. Bunce, Milwaukee retailer, in conducting an open forum, but "we got away from that altogether."

Bunce urged retailers to "do everything you can to defeat licensing of anyone in the oil industry. No legislative act is going to clean up your industry, or any other industry unless the industry is classed as a public utility. If oil is a public utility lots of us will be classed as useless."

General topics discussed on the floor during open forums included:

California's fair trade laws, with Paul Davis, president of Retail Petroleum Dealers Assn. of Los Angeles, explaining the laws, urging co-operation with suppliers, and relating how Los Angeles retailers were endeavoring to stop premiums.

Chicago's price war, with the statement from the floor that hope rested in use of the Illinois fair trade law by suppliers on regular and first grades, leaving third grade for meeting price competition. Charges were made that some retailers have been existing through depleting inventories, that 75 per cent of Chicago's stations are major company owned, and that average volume is 6000 gallons monthly.

Obtaining co-operation of lessee operators in association work with dealers.

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'Gas' Consumption Of Airlines Rises

WASHINGTON, Oct. 3.—American-operated scheduled airlines consumed 21,606,485 gallons of gasoline during the first six months of 1938, compared with consumption of 19,130,285 gallons during the first half of last year, according to Civil Aeronautics Authority.

Oil consumption this year, however, was down slightly—396,076 gallons as compared with 398,856 gallons first six months of 1937.

In the first half of 1937 the lines flew 12.64 passenger-miles per gallon, whereas in 1938, the passenger-mileage-per-gallon was 13.40.

The figures are for American-owned planes, in regular scheduled service, including some foreign flights made by American-owned routes as well as routes in the territories—Alaska and Hawaii.

The average speed for the lines was 152 miles per hour.

Refining Technology

What Price Poly. Feed Recovery?

By Arch L. Foster, Technical Editor

Various processes and methods indicate indubitably that polymerization of gases, until recent years a chimera of the long-looking researchers' brains and test tubes, is emerging from its swaddling clothes and beginning to teeter about on far from unsteady legs. Polymerization of hydrocarbons has been known as a chemical reaction for decades; how to do the thing commercially is the new Baby.

Gradually the prospects are being clarified, and we begin to see certain lines of progress which we can expect to follow. The first effort was to learn how to convert refinery cracked gases into a profitable product rather than use them as a practical waste, for plant fuel. Two tools have been provided for this purpose, thermal and catalytic polymerization. That such tools have been applied on a small scale to lubricating oils and sundry other products shows merely that the principle is widely, possibly generally applicable for the production of improved refinery products.

Catalysis is working gradually into practically every major field of refining technology. A relatively new catalytic process has been under trial for a considerable time and we are told quotations have been made to prospective licensees in the industry for construction of units using this process.

One of the problems in the utilization of saturated hydrocarbon gases has been the economical production of olefins therefrom, as intermediates for making motor fuel or for chemical syntheses. This has been done thermally but with relatively low yields. Now comes Shell Development Co. research engineers with a process for forming olefins at relatively high temperatures but low pressures by the use of an alumina catalyst activated with finely divided metal or metallic oxide. This appears to clear another hurdle. Dunstan and his co-workers of the Anglo-Iranian show how paraffins and olefins can be condensed or alkylated to form saturated motor fuels of extremely high octane number, without the heavy expense of hydrogenation.

Recently the Kellogg engineers have shown that self-refrigeration is an economical means for recovering natural gasoline and polymerizer feed (the C_3s and C_4s), as well. Refrigeration has been used in many cases for various results in natural gasoline and vapor recovery plants, and this may be a solution to the problem of cheap polymerizer feed recovery.

Suppose we do a little imagining, a little putting together to see what comes out. Imagine a system like this; propanes and butanes recovered more economically than older processes can do it, by refrigeration or any other practicable means. Imagine again the division of this stock into two parts, one of which passes through the catalytic dehydrogenation unit to form olefins, the other remaining in a gas holder or liquefied under pressure as paraffins and/or iso-paraffins.

Then combine these two "streams" in the catalytic or other alkylation unit. The result is, researchers tell us, a saturated iso-paraffinic product of the gasoline boiling range, varying anywhere from 80 to 100 or higher octane number. If the conventional hydrogenation processes are too expensive, as we are told they are, this system operates at low pressures and, with one exception, low temperatures, avoiding the expense of higher conditions. Three steps only are necessary to complete the job from gaseous products to saturated gasoline hydrocarbons, avoiding hydrogenation or other steps under expensive conditions. The direction which research is trending now is obvious and the results give plenty of reason for continuation of the work.

And refining research engineers and chemists are proved crazy — like foxes!

●

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What Price Poly. Feed Recovery? **R-481**

Proposed Method of Test for Ignition Quality of Diesel Fuels **R-482**

Proposed method for determining the ignition quality of diesel fuels, in terms of the percentage of cetane in a mixture of cetane and alpha-methylnaphthalene showing the same ignition characteristics as tested fuels.

"State of the Art" as seen in the World's Current Technical Literature **R-488**

Hydrodynamic Principle Absent in Boundary Lubrication—by A. W. Burwell and J. A. Camelford **R-492**

An explanation of the lubrication principles discussed by Ir. G. Lieth in the Dec. 29th issue, which was a criticism of the third article by the authors on these principles.

Activities of Equipment Manufacturers **R-495**

Patent Literature of Today **R-496**

Advertisers' Index ..... **R-495 and 48**

Proposed Method of Test for Ignition Quality of Diesel Fuels

(Released for Publication *for information only* by Co-Operative Fuel Research Committee*)

This method for determining cetane number of diesel fuels as the index of ignition quality is the result of several years work by a co-operating group of petroleum and automotive technologists, originally working as a Volunteer Group, later incorporated with the Co-Operative Fuel Research Committee as its Diesel Fuels Division.

The method is not adopted as standard by either the CFR or the American Society for Testing Materials, but is released for publication to elicit criticism and invite co-operation. Study and development work will continue by the division and all co-operating laboratories on the method as presented here, preparatory doubtless to adoption of the method eventually developed as standard for the industries interested.

Following the general principle of the Octane Number Test Method, this test determines the Cetane Number of diesel fuels by comparing in a continuously variable compression single-cylinder engine the ignition characteristics of a sample of fuel with mixtures of the primary reference fuels cetane and alpha-methylnaphthalene, or with secondary fuels calibrated in terms of these primary fuels. The Cetane Number of a fuel is the percentage of cetane in a mixture of it with alpha-methylnaphthalene which matches the tested fuel in ignition quality.

The method presented here is the exact method to be used by the co-operative group in further study to perfect details of the method before its adoption as a standard method. Copies of the method are obtainable from The American Society For Testing Materials, 260 Broad Street, Philadelphia.

1. **Scope.**—This method of test is intended for determining the ignition quality of Diesel fuels in terms of an arbitrary scale of cetane numbers.

2. **Cetane Number.**—The cetane number of a Diesel fuel is defined by and is numerically equal to the percentage by volume of cetane in a mixture of cetane and α-methylnaphthalene which the fuel matches in ignition quality when compared by the procedure specified herein. Thus, by definition, α-methylnaphthalene has a cetane-number rating of zero and cetane of 100. Cetane number is reported to the nearest whole number.

APPARATUS

3. **Apparatus.**—The ignition-quality testing unit described in this section shall be used without modification. It shall be known as the "C.F.R. Diesel-Fuel Testing Unit."[1] The apparatus shall consist of a continuously-variable-compression engine, together with instrument panel, base, and suitable loading and accessory equipment, as follows:

*Published as an appendix to the 1938 Report of Committee D-2 on Petroleum Products and Lubricants.

[1] At present the sole authorized manufacturer of the C.F.R. Engine is the Waukesha Motor Co., Waukesha, Wis. Other manufacturers may be approved in the future, but testing laboratories should not purchase testing units except from the Waukesha Motor Co. without ascertaining whether such units have been approved. Inquiries in this connection should be directed to Mr. R. P. Anderson, Secretary of Committee D-2 on Petroleum Products and Lubricants, 50 West Fiftieth Street, New York, N. Y.

(a) Engine. — Continuously-variable-compression, one-cylinder, with dimensions as follows:

Bore, in.	3.25
Stroke, in.	4.50
Displacement, cu. in.	37.4
Turbulence combustion chamber:	
bore, in.	1.625
length, in., adjustable	0.375 to 2.750
Valve-port diameter, in.	1.187
Connecting-rod bearing:	
diameter, in.	2.25
length, in.	1.625
Front main bearing:	
diameter, in.	2.25
length, in.	2.00
Rear main bearing:	
diameter, in.	2.25
length, in.	4.25
Piston pin, floating, diameter, in.	1.25
Connecting rod, length, center to center, in.	10.00
Timing-gear face, in.	1.00
Piston rings, number	5
Exhaust pipe, diameter, in.	1.25
Weight of engine, lb. (approximate)	475
Weight of complete unit, lb. (approximate)	1375

(b) Crankshaft.—Fully machined, heat-treated, and counter-balanced.

(c) Crankcase.—Cast iron.

(d) Connecting Rod.—Rifle-drilled, S.A.E. No. 1045 steel, heat-treated, bearing alloy cast directly into big end.

(e) Main Bearings.—Renewable sleeve bushings, babbitt-lined.

(f) Valves.—Silcrome.

(g) Push Rods.—Mushroom type with lock-nut adjustment.

(h) Cylinder.—Cast-iron alloy, bored and honed, Brinell hardness 220 ± 20.

(i) Cylinder Head.—Detachable variable-compression high-turbulence.

(j) Cooling System.—Evaporative.

(k) Lubrication.—Pressure feed to main, connecting-rod, piston-pin and camshaft bearings, to idler-gear stud and gears, and to valve rocker arms.

(l) Oil Heater and Thermometer.—Electric heater in base to bring oil to operating temperature quickly, and a thermometer on the instrument panel to indicate when equilibrium temperature has been reached.

(m) Air Heater and Thermometer.—Electric heater mounted on intake silencer to maintain constant air-inlet temperature, and a thermometer at base of silencer to indicate this temperature.

(n) Water Heater and Thermometer.—Electric heater in cooling-water line between outlet of condenser and inlet to cylinder jacket to bring water to operating temperature quickly, and a thermometer between condenser and heater to indicate this temperature.

(o) Injection System.—This system shall consist of the following parts as furnished with the engine:

(1) Injector pump, Bosch specification PE1B50A 302/3S97, port closing at 0.075 to 0.090 in. lift from base circle.

(2) Injector, Bosch specification DN—30S3.

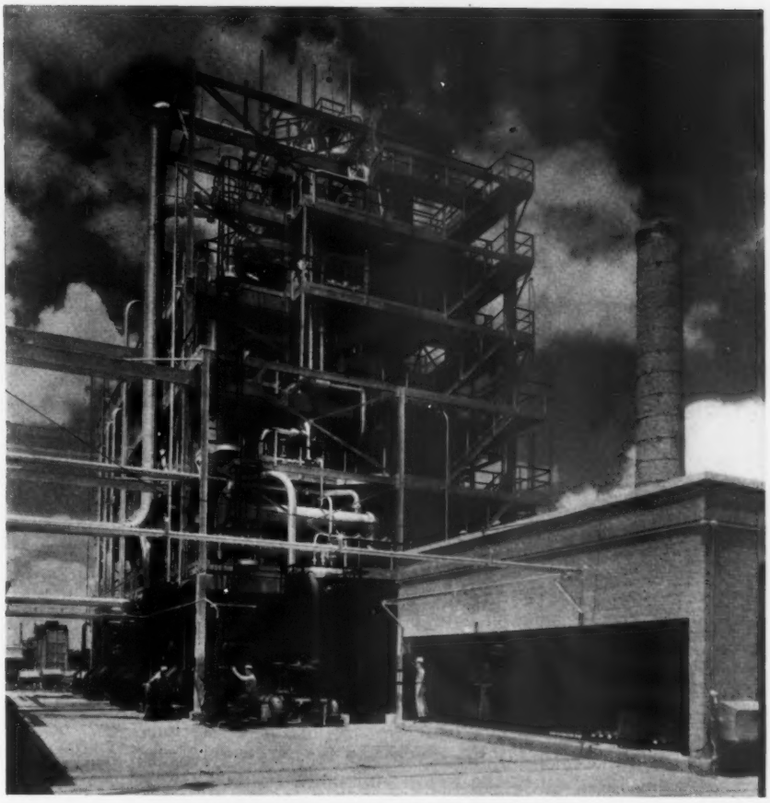
(3) Fuel line (tank to pump), ⅜-in. copper tubing, bottom of fuel tank to be 25 ± 1 in. above pump inlet.

(4) The injection line, ¼ in. O.D., ⅛ in. I.D., and 36 in. in length.

(5) Vertical open riser with measuring burette located on pump sump outlet.

(p) Instrumentation.—The ignition quality is meas-

THERMAL Polymerization



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Converts butanes and propane into premium grade gasoline

The thermal polymerization process as licensed by Polymerization Process Corporation permits this unit to handle saturated feed stocks from the natural gas fields along with varying proportions of saturated and unsaturated fractions from by-product refinery gases. Feed composition is influenced by the seasonal volatility requirements of motor fuel, supply and demand, and other factors. The ability to produce high blending value motor fuel from the currently available feed stocks permits the maximum return to be secured under a wide range of conditions.

The economic advantages of thermal polymerization are of interest to every refiner and natural gas plant operator.

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ured by the coincident-flash fixed-delay method using neon lights which are located on the periphery of the flywheel and are operated by contact points on the combustion and injection indicators. The necessary instrumentation consists of the following parts:

(1) The combustion indicator which mounts in a tapped hole (⅞ in. by 18 threads per inch) in the combustion chamber and is equipped with a spring-steel indicator diaphragm 0.543 ± 0.003 in. in diameter and 0.015 ± 0.0005 in. in thickness. The contact points are mounted on bronze leaf springs 0.021 ± 0.0005 in. in thickness. Graduated spring-tension adjusting screws are provided. In addition, a graduated gap-adjusting screw is provided with a spring cushion plunger to protect the contact points against overloading as the result of combustion pressures.

(2) The injection indicator, which utilizes contact-point assembly parts similar to the combustion indicator, with brackets for attachment to permit operation of the contact points by movement of the injector valve.

(3) The neon light mount which carries two ¼-watt, 110-v., neon bulbs located behind an aperture plate with 13 deg. spacing between openings.

(4) The sight tube and top dead center reference mark with brackets.

(5) Flywheel slip rings and brush holders with necessary brackets and wiring for the neon-light support.

(6) A 110-v. d-c. generator to supply current for the injection and combustion indicators. This is belt-driven from the power-absorbing unit described under Paragraph (q). The voltage is controlled to 115 ± 5 v. by means of a field-rheostat located on the instrument panel.

(q) Power-Absorbing Unit.—The engine is connected by V-type belts to an electric generator which preferably should be an induction motor with synchronous characteristics, but may be any electric generator capable of maintaining proper operating conditions. In most cases the electric generator will act as a starting motor to crank the engine, but if a direct-current generator is used and no outside source of current is available, the engine may have to be cranked by hand.

(r) Panel.—A control panel with starter switches, heater switches, and oil-temperature and pressure gages is included as part of the unit.

(s) Base.—The complete unit is mounted on a cast-iron base.

4 Foundation.—The foundation shall be of concrete, at least 15 in. in height above the floor level, resting, if possible, directly on the ground. Otherwise, special provision must be made to eliminate vibrations that may influence ratings and the manufacturer should be consulted. For convenience in operation, the foundation should be located at least 2 ft. from any wall. Dimensions are furnished with the apparatus.

5. Reference Fuels.—The primary reference fuels[2] shall be normal cetane and α-methylnaphthalene. Secondary reference fuels,[3] suitably calibrated against these primary reference fuels, are normally used in actual testing.

PROCEDURE

6. Standard Operating Conditions.—The engine shall be run under the following standard conditions:

(a) Engine Speed.—Constant, 900 ± 9 r.p.m.

(b) Jacket Temperature.—Constant within ± 1 F. (0.6 C.) and at a temperature between the limits of 209 and 215 F. (98 and 102 C.).

(c) Cooling Liquid.—Distilled water or rain water, or ethylene-glycol solution when necessary at high altitude.

(d) Crankcase Lubricating Oil.—S.A.E. 30.

NOTE 1.—The viscosity range of crankcase lubricating oil, S.A.E. 30, is from 185 to 255 sec. when determined on the Saybolt Universal viscosimeter at 130 F. (54.4 C.), in accordance with the Standard Method of Test for Viscosity by Means of the Saybolt Viscosimeter (A.S.T.M. Designation: D 88) of the American Society for Testing Materials.[4]

(e) Oil Pressure.—25 to 30 psi. under operating conditions.

(f) Oil Temperature.—The electric oil heater shall be used only to raise the oil temperature rapidly to the equilibrium operating temperature, 120 to 150 F. (49 to 65 C.), normal operation maintaining the equilibrium thereafter. By "equilibrium" is meant that steady temperature attained by the oil upon continuous operation of the engine without the use of the heater.

(g) Valve Clearances, Cold.—Intake 0.008 in., exhaust 0.010 in.

(h) Injection Advance.—13 deg. b.t.d.c. for rating and 5 deg. (±2 deg.) b.t.d.c. for combustion contact setting.

(i) Injection Pressure (injector opening pressure).—1500 ± 50 psi. (106 ± 4 kg. per sq. cm.).

(j) Injection Quantity.—13.0 ± 0.5 ml. per minute, to be checked on each test sample and reference fuel blend.

(k) Injection Pump Setting.—See Paragraph 3 **(o)** for injection system specifications.

(l) Injector Cooling-Water Jacket Temperature.—100 ± 5 F. (38 ± 3 C.).

(m) Exhaust Pipe—A separate exhaust pipe shall be used for each engine. It shall be made of pipe of not less than 1¼ in. in inside diameter having a maximum of two ells and a total length not to exceed 20 ft. The use of a short straight-through muffler with passage 1¼ in. in diameter is permissible.

(n) Air-inlet Temperature.—The air-inlet temperature shall be maintained at 150 ± 2 F. (66 ± 1 C.).

(o) Clearance Volume.—The clearance volume measured to the top face of the combustion indicator hole shall be 72 ± 0.5 ml. with the engine at top dead center. At this volume the micrometer should be set to read 2.000 in. The compression ratio is given by the equation:

$$\text{C.R.} = \frac{18}{L} + 1$$

where L = the length of the combustion chamber in inches as measured by the micrometer.

7. Starting and Stopping the Engine.—While the engine is being turned over by electric motor, the fuel by-pass valve on the injector shall be closed and the compression ratio increased until the engine begins to fire. To stop the engine, the fuel by-pass valve on the injector shall be opened and the electric motor then switched off.

8. Checking Injection Pump for Port Closing.—The pump-plunger port should close when the plunger has traveled up 0.075 to 0.090 in. from the base circle of the cam. This setting is important as it influences the injection rate. This adjustment is made in the factory and should not require resetting unless it has been tampered with. To check the port closing the following operations shall be made:

(a) Remove the discharge valve and spring from the top of the pump and replace the discharge valve clamp nut with injection tube arranged conveniently for blowing into.

(b) Submerge the end of the fuel drain line in oil.

(c) Remove the pump cover, open the fuel pump rack to its wide open position, and turn the engine until the pump plunger starts up. Then blow on the tube and at the same time turn the engine slowly until bubbles disappear at the end of the fuel drain line which is submerged in oil. When bubbles cease, it indicates that the port has just closed. Determine this point carefully by several trials and mark the flywheel.

(d) Remove the tube used for blowing into the pump and insert a pin in the discharge valve hole and resting on the top of the plunger. Arrange a dial indicator resting on the pin to indicate the pump plunger lift. With the plunger at the bottom of its stroke and the dial gage set on zero, turn the engine until the reference mark previously placed on the flywheel to indicate point of port closing registers. Then read the dial gage which will indicate the pump plunger lift from the base circle when the port closes. This should be 0.075 to 0.090 in. Any deviation from this value can be adjusted by turning the pump-plunger adjusting screw. After making an adjustment a new reference mark must be established on the flywheel as outlined in Paragraph **(c)**.

9. Injection Pressure Setting.—The injection-pump

[2]Normal cetane is available from E. I. duPont de Nemours and Co., Wilmington, Del., and α-methylnaphthalene, from the Reilly Tar and Chemical Co., Indianapolis, Ind.

[3]High-cetane secondary reference fuel known as "shell high-cetane reference fuel" is available from the Shell Petroleum Corp., Wood River, Ill. Low-cetane secondary reference fuel, a mixture of α- and β-methylnaphthalenes, is available from the Reilly Tar and Chemical Co., Indianapolis, Ind.

[4]1938 Supplement to Book of A.S.T.M. Standards.

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ELBOWS—90°, 67½°, 60°, 45°, 30°, 22½°, 11¼°, and 5⅝°, Street, Long Sweep, Side Outlet, Drop, Hub Vent

TEES—Service, Four-Way, Drop Tees, Long Sweep, Double Sweep, Wash Tray

COUPLINGS—Right Hand, Right and Left, Half (Also Wrought Iron), Reducers, Increasers

BUSHINGS—Outside and Inside Hexagon, Face, Eccentric, Double Tapped

PLUGS—Square Head, Solid, Countersunk, Bar, Barrel

NIPPLES—Close, Short, Long, Tank

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cover shall be removed and, with injection-line pressure gage connected and injector arranged to spray into the air, the pump plunger shall be operated with a screw driver used as a lever. With the pressure gage set at 1500 psi. (106 kg. per sq. cm.), the pressure on the injector spring shall be adjusted until equal quantities of fuel spray from the gage and the injector. The opening pressure of the injector will then be the same as indicated on the gage.

10. Injection Indicator Contact Setting.—The injection indicator contact setting shall be made as follows:

(a) Adjust injection contact mounting bracket until there is about 1/32-in. clearance between the spring leaf and the injector pin.

(b) Screw out center adjusting screw.

(c) Adjust the lower leaf until it just touches the end of the injector pin. Then apply tension by turning the screw down one more complete turn.

(d) Adjust the upper leaf by turning down the upper leaf adjusting screw until the contact points touch. Be sure that the points touch as a result of the leaf-spring tension and not because of force applied downward by the adjusting screw. If the latter should be the case, it is necessary to remove the spring and bend it slightly downward at the outer end. The adjusting screw should then be turned up one complete turn from this position.

(e) Adjust the bumper-spring tension in the center adjusting screw by turning down the bumper-spring adjusting screw as far as it will go.

(f) Adjust the contact-point gap, with the engine running normally and the neon indicating switch closed, by screwing down the center adjusting screw until the neon tube just makes a solid band of light around the flywheel. Then turn back the center adjusting screw two divisions (0.002 in.) and lock by means of clamping screws.

11. Combustion Indicator Contact Setting.—The combustion indicator contact setting shall be made as follows:

(a) Screw out center adjusting screw.

(b) Adjust the lower leaf until it just touches the end of the combustion indicator pin. Then apply tension by turning the screw down one more complete turn.

(c) Adjust the upper leaf by turning the upper leaf adjusting screw down until the contact points just touch. Be sure that the points touch as a result of the leaf-spring tension and not because of force applied downward by the adjusting screw. If the latter should be the case, it is necessary to remove the spring and bend it slightly downward at the outer end. The adjusting screw should then be turned up one complete turn from this position.

(d) Adjust the bumper-spring tension in the center adjusting screw by turning down the bumper-spring adjusting screw as far as it will go.

(e) Make preliminary contact-point adjustment by screwing down the center adjusting screw until there is a gap of approximately 0.010 in.

12. Final Combustion Indicator Contact Setting.—The final combustion indicator contact setting shall be made as follows:

(a) Carry out this setting for each test fuel.

(b) Adjust compression ratio until engine fires normally on sample fuel. This is about two ratios above the lowest operating ratio without misfire.

(c) Close neon indicating switch.

(d) Check injection angle to make sure it is 13 deg. b.t.d.c. with engine operating on sample fuel. The injection neon tube is displaced 13 deg. on the flywheel to make it flash at t.d.c. when injection actually occurs at 13 deg. b.t.d.c.*

(e) Make preliminary compression-ratio adjustment until combustion, as determined by the "hook" method, occurs at top dead center. The "hook" method is as follows:

The combustion indicator pin is restrained to follow the diaphragm by means of a leaf spring. The spring pressure is such that for accelerations up to the maximum rate of pressure rise due to compression pressure the pin is held on the diaphragm. Thus the gap between the indicator pin and the upper contact is an accurate measure of the deflections of the diaphragm. The position of the diaphragm is a function of the crank angle of the piston and thus the position of the upper contact pin determines the angular position of the neon flash.

Near the flat top of the compression pressure diagram, therefore, a very slight contact point movement indicates a considerable flywheel angular movement and the neon tube flash position is very sensitive to the contact gap adjustment. But when combustion occurs the very steep pressure rise of the diagram makes the neon flash position very insensitive to contact gap adjustment. The transition from the sensitive to insensitive gap adjustment range is called the "hook" point.

The contact adjustment procedure is to turn up the upper contact adjusting screw from a closed position until the rapid movement of the flash suddenly changes to a slow movement for a given constant angular motion of the contact adjusting screw. This is the "hook" point and the position of the neon flash indicates the start of combustion.

(f) For final-combustion contact-point adjustment retard injection timing to 5 deg. b.t.d.c.

(g) Adjust upper contact until two flashes of the neon bulb on the flywheel are just seen, one at t.d.c. from compression pressure and the other about 10 deg. a.t.d.c. from combustion.

(h) Raise upper contact one-half division (approximately 0.0005 in.) on adjusting screw where only one flash from combustion will be seen.

13. Rating.—(a) The injection shall be reset to the rating position of 13 deg. b.t.d.c., which will make the injection flash appear at t.d.c.

(b) The final compression ratio shall be adjusted so as to give coincidence of the injection and combustion neon flashes. The combustion chamber length shall then be recorded. It is advisable to check combustion contact point setting by moving injection timing and watching whether or not the combustion and injection flashes move and are still coincident. If so, the setting is correct.

(c) From the combustion chamber length, recorded when the sample fuel has been adjusted, to operate at standard conditions with 13 deg. delay period, the cetane number of the unknown sample shall be estimated and two reference fuel blends selected, differing by not more than eight cetane numbers, which will bracket the unknown sample. When two reference fuels have been found, one of which has a longer delay period and the other a shorter delay period than the sample, alternate readings shall be taken by adjustment of the combustion chamber length until the neon light flashes coincide at t.d.c. Alternate readings between the sample and reference fuels shall be taken in the following order; Sample, reference fuel No. 1, reference fuel No. 2, sample, reference fuel No. 1, and reference fuel No. 2. After changing from one fuel to another, 5 min. shall be allowed before taking a reading to insure complete flushing of the injection system. The average combustion-chamber lengths obtained from the above series shall be used in calculating the cetane number.

14. Calculation.—The cetane number of the fuel shall be calculated by interpolation from relative combustion-chamber lengths as obtained in Section 13 **(c)**. The cetane number shall be reported to the nearest whole number. When the calculated value falls exactly half-way between two whole numbers, the nearest even number shall be reported.

MAINTENANCE

15. Maintenance.—The following points are important in maintenance technique:

(a) Injector should be inspected and cleaned at least every 8 hr. of operation.

(b) Compression plug should be cleaned when it becomes tight due to carbon.

(c) Special care should be exercised in keeping the fuels and fuel system clean.

(d) A general overhaul, including the grinding of valves, cleaning of piston and rings, and cylinder and cylinder head, should be made every 75 hr. of operation.

(e) Periodic inspection of connecting-rod and main bearings is recommended.

*b.t.d.c.=Before Top Dead Center; t.d.c.=Top Dead Center—Ed.

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Oiliness Nut Being Cracked

Oiliness attributes of lubricating oil can be accounted for by known properties. J. W. Givens, Shell Development Co.

Differences in frictional characteristics of three oils which might be ascribed to oiliness have been accounted for by known properties of the oils. An analysis was made of data on the temperature rises in the three oils while lubricating a partial bearing at high loadings. Using the pressure coefficients of viscosity of these oils, and operating variable was calculated that accounted for the observed temperature rises.

Calculations made on data presented by H. A. Everett a year ago at the semi-annual meeting of the Society for Automotive Engineers throw further light on the mechanism of lubrication in relation to the effect that the change of viscosity with pressure might have.

Examination of the data relating viscosity to pressure showed that they could be represented in the region above 6000 pounds per square inch with reasonable accuracy by an equation of the form:

$$\log_{10} \frac{Z}{Z_o} = aP$$

This is an integral of the equation $\frac{1}{Z}\frac{dZ}{dP} = a$

Here Z is the viscosity at the applied pressure P, Z_o is the viscosity at atmospheric pressure, and a is the pressure coefficient of viscosity which varies with the nature of the oil and with temperature.

The variation of a with temperature is shown to be such that at intermediate temperatures linear interpolation may be used without great inaccuracy. The data shows further that the relation between aP and an increment of temperature is nearly the same for all three oils and the form of the curve suggests that the temperature rise should be proportional to $(aP)^2$. This proved to be the case and thus a single variable has been found that will account for the results obtained for the different oils and this involves no assumptions regarding pressure distribution.

The discovery that the variation of temperature rise with load could be accounted for by aP, a quantity whose calculation involves no assumptions, indicates that the calculation of G, defined as the product of viscosity and angular velocity divided by load per unit area of bearing surface, may be in error. This means that the calculation of the equivalent viscosity must be incorrect because of assuming an incorrect pressure distribution and any conclusions reached using G may be incorrect.

The fact that the value of aP determines the temperature rise for all the oils studied shows that the observed effects may be explained by the variation of viscosity with both temperature and pressure. Since the variation in coefficient of friction is not of great importance, it is felt that the added safety obtainable by the use of oils having high pressure coefficients of viscosity is worthy of consideration.

Since these experiments and results represent only a single set of measurements, the calculations given have supported Everett's general conclusions but more experiments are required to confirm fully the theory here outlined.

Pressure on Lubricating Greases

Accelerated "bleeding" of oil from greases gives initial oil loss rates which can be correlated with "bleeding" of oil from greases in storage. B. B. Farrington and R. L. Humphreys, Standard Oil Co. of California.

Bleeding of a grease will increase with a decrease in the viscosity of a mineral oil, with an increase of mineral oil content, with an increase ih the coarseness of soap fibers, and with either increases of pressure or temperature. These results were determined experimentally with a grease press designed by W. H. Herschel (A.S.T.M. Proceedings, Vol. 33, Part I, p. 343).

While it is "premature to predict the uses to which the data obtained with the grease press can be put, other than to predict the 'bleeding' characteristics of greases, the results seem to be at once applicable to problems involving the use of spring loaded grease cups and high pressure grease distributing systems where static pressure is operating on greases contained in tubing and pipe lines."

"The effect of pressure on a lubricating grease contained in a moving bearing is probably masked by mechanical effects resulting from the motion of the bearing parts and any oil tending to separate from the grease is probably worked in again almost immediately."

The empirical equation given below was developed, which represents the amount of oil pressed from a grease in a given time by the Herschel grease press:

$$L = \frac{T}{a + bT}$$

Where L = Oil loss in weight per cent
T = Time in hours
a is a constant representing a measure of loss of oil at the start of the test and b is a constant used to determine the ultimate amount of oil that can be squeezed from the grease.

The nature of the soap base used for compounding greases was found to influence the amount of oil capable of being pressed out. The mineral oil tends to be more firmly held by the smaller soap fibers, although other factors, such as viscosity, predominate under certain circumstances. More oil can be pressed from the fibrous sodium soap greases than from the smoother textured calcium and aluminum soap greases. This is probably due to the relative coarseness of the sodium soap fibers, in comparison with the fine structure and greater surface area of the calcium and aluminum soap particles. However, the ability of the soap fibers to retain oil (as reflected by the ultimate oil loss) is not a factor in the bleeding of oil from greases in storage.

The results on six different greases showed that the "bleeding" rate is practically constant for each grease over a six-month period.

The method found most satisfactory for testing greases with the grease press is as follows: A two-gram grease sample, placed between two filter papers enclosed in two blotting paper discs, is clamped in the press and pressure applied with a five-pound plunger for two hours. The oil loss is determined then, and again after another hour in the press.

The quantities T/L are plotted against T to determine the ultimate loss ($1/b$) and the constant a (intercept on the T/L axis). If preferred, L/T can be plotted against L, when

The installation shown here is located at Sewalls Point, Va. The Balloon measures 114 ft. in diameter and is connected to the vapor spaces of a 10,000-bbl., three 55,000-bbl. motor gasoline storage tanks and to two 18,000-gal. gasoline loading rack tanks.

The WIGGINS BALLOON SYSTEM

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THE Wiggins Balloon is the key unit around which vapor saving systems can be built to serve almost every conceivable combination of oil storage tanks that can be made gas-tight and contain grades of oil that do not boil at ordinary atmospheric pressures.

The efficiency and economy of the Wiggins Balloon Vapor Saving System is made possible because of the following advantages:

1. Large vapor holding capacity can be secured at a low unit cost. Future operations need never be hampered by necessity of long periods to pay off investment.

2. Gives protection against both pumping and breathing losses. In actual operation, balancing between tanks being emptied and filled has the effect of increasing the capacity of the system.

3. Adds no additional labor or supervision expense. Users are of the opinion that balloons will have life equal to steel tanks.

4. Permits modernization on a large scale. Any ordinary tank that can be made gas-tight can be used as part of the system.

5. A single system can provide protection for various oil products that do not boil at atmospheric temperatures. The only precaution is that tanks storing sour and sweet oils should not be connected into the same system.

6. Protects the quality of the product in a number of ways. The prevention of evaporation loss prevents loss in gravity. One user reports important savings by preventing dust from being breathed in and discoloring finished gasoline.

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FABRICATING PLANTS in Birmingham, Chicago, and Greenville, Pa.

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the ultimate loss and the intercept on the L/T axis will be l/a or the initial loss rate.

Although the Herschel grease press or a similar device may tell something about the fine structure of lubricating greases, such as the soap fiber spacing and the ability of the soap fibers to adsorb oil, it is probable that the syneresis of the grease gels depends upon factors other than those discussed. Physical and chemical changes in the soap fibers themselves can conceivably account for loss of oil over long periods of time. The effect of temperature is also complicated and preliminary tests showed that no conclusions could be drawn without an extended set of experiments.

* * *

Particle Size of Catalysts

Optimum grain size of porous catalytic materials is determined mathematically. E. W. Thiele, Standard Oil Co. of Ind.

The activity of a porous catalyst, below a certain grain size, is proportional to the amount present, a mathematical treatment of catalytic particles indicates. If the grain size is much larger, the activity will depend on the total external surface of the grains. The dividing region between these two conditions is determined by a dimensionless quantity or modulus $x_s\sqrt{\frac{c}{rk}}$, where x_s is the radius of the grains, c the activity of unit internal surface of the pores, r the hydraulic radius of the pores, and k the diffusion coefficient. With consistent units the transition values of the modulus ars close to unity.

Qualitatively the size of the grains cannot be indefinitely increased without ultimately reaching a point at which the reaction will produce products in the interior of the grain faster than diffusion can carry them away. The reaction will then tend to be confined to the outer layers of the grain, the interior being relatively inactive. As the grain size is further increased, the catalytic activity will tend to become proportional to the external surface of the grains.

Althoug the behavior of catalysts in respect to grain size was not determined independently, it is believed that the results give a correct idea of the influence of various factors in predicting the effect of varying grain size on activity.

The quantity to be determined mathematically is the ratio of the reaction rate with a given grain size to the reaction rate that would be observed if the composition of the fluid throughout the interior of the grain were the same as in the fluid surrounding the grain. In other words, it was desired to determine the reaction rate as a fraction of the rate that would be observed with the same amount of catalyst divided into infinitely small grains.

In curves relating the modulus to actual activity under various assumptions of grain shape and types of reactions a similar trend was noted. For values of the modulus much smaller than unity, the relative reaction rate is nearly unaffected by changes in the modulus resulting from changes in grain size. For values much greater than unity, the relative reaction rate falls off inversely as the modulus, and is, therefore, proportional to the external surface.

In general, it may be said that for any given reaction at a given temperature and pressure and with a given catalyst, there will be a certain grain size below which the catalyst volume will tend to control the rate of reaction, and above which the catalyst external surface will tend to control.

A word of caution is given regarding the relation of temperature and activation energy of the reaction where the energy may appear to be abnormally low for a temperature rise.

Corrosion from Chloro-Organic Compounds

Prevent corrosion of refining equipment from well cleaning compounds. R. H. Gardner, J. W. Teter, and L. I. Hansen, Sinclair Refining Co.

The question as to whether the effects on refinery operation would be improved by the substitution of carbon tetrachloride for hydrochloric acid in cleaning out oil wells is answered in the negative following laboratory investigation. Hydrochloric acid corrosion enhancement may be prevented by efficient desalting provided it is performed before flashing to avoid potentially corrosive chlorohydrocarbons.

Crude oil was heated in the laboratory with carbon tetrachloride and moisture under conditions of crude heat exchange (350° F.). Hydrochloric acid was evolved copiously and chloro-compcunds were produced. In commercial operation whatever carbon tetrachloride did not decompose in crude heat exchange before the primary flash would be found in the straight-run gasoline. Regular gasoline blends with carbon tetrachloride showed no significant changes in oxidation susceptibility and anticxidant efficiencies but octane and TEL susceptibilities were seriously lowered.

It was confirmed that chlorination of certain oil molecules can occur by reaction of magnesium chloride and thus produce corrosive action on refining equipment. Several fractions were digested with magnesium chloride and water under conditions comparable to crude heat exchange and flashing operations. Digested samples, after careful washing and drying, contained chlorine in the order of 0.0007 to 0.002%.

It is concluded that cracking coil corrosion could be combatted successfully without desalting by using expensive non-corrosive alloy tubes, but heater tube coking, plugging of condensers and increased hydrogen bisulfide evolution would remain important problems. Efficient desalting would prevent hydrochloric acid corrosion enhancement, but desalting should be performed before flashing to avoid potentially corrosive chloro-hydrocarbons.

* * *

Lubricant Fraction Analysis

More details are presented on the chemical constitution of the lubricant fraction of a Mid-Continent crude. B. J. Mair, C. B. Willingham, and A. J. Streiff, National Bureau of Standards.

The following conclusions have been made concerning the chemical constitution of the lubricant fraction of a Mid-Continent petroleum from which the "wax" and "asphaltic" constituents have been removed and a correlation has been made of the properties of 179 fractions prepared by extensive distillation and extraction of the "extract" portion with available data on synthetic hydrocarbons.

About 70% of the material consists of naphthenes with from one to three rings per molecule (a very small amount of material containing four naphthenic rings is probably present also). About 12% of the material consists of molecules with one aromatic ring and from one to three naphthenic rings per molecule, and with this material is associated a small amount of sulfur and oxygen compounds. About 10% of the material consists of molecules with two aromatic rings (linked through two carbon atoms) and about two naphthenic rings per molecule, and with this material is associated a small amount of sulfur and oxygen compounds. About 8% of the material consists of molecules with more than two aromatic rings (each probably linked through two carbon atoms) and one or two naphthenic rings per molecule, and with this material is associated some sulfur, nitrogen, and oxygen compounds.

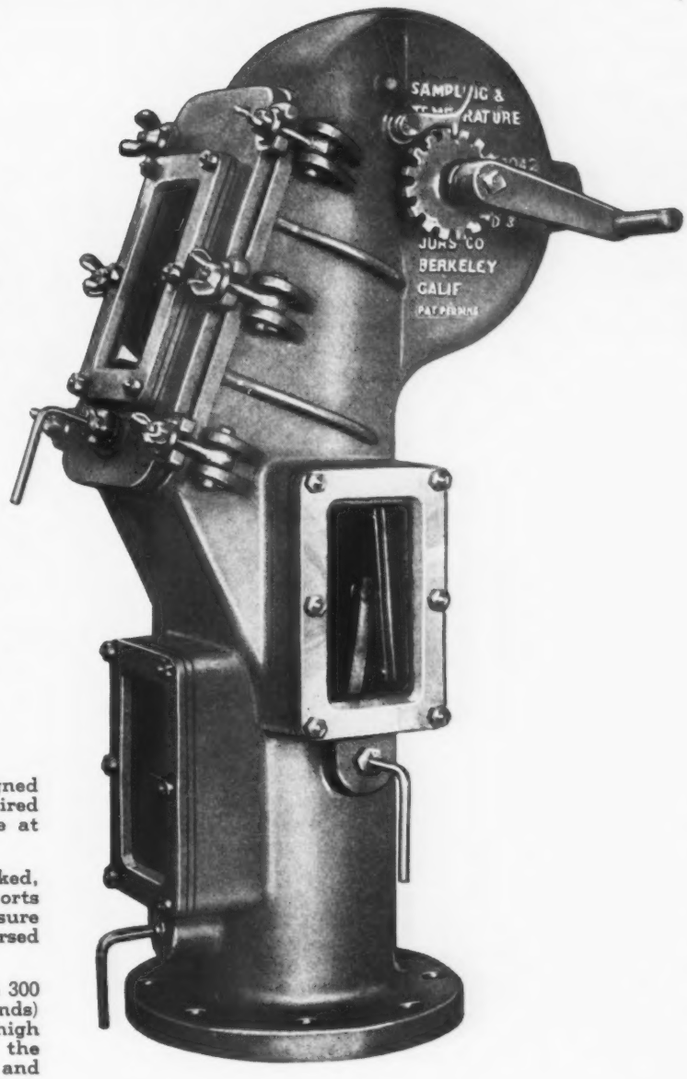
A detailed discussion is made of the properties: specific optical dispersion, specific optical refraction, specific optical rotation, aniline point, viscosity, viscosity index, and boiling points in relation to plotted data showing the variations of these physical and chemical properties by per cents extracted and the inter-relations of these curves for the various properties.

A Practical Method of High Pressure Sampling

With the advent of petroleum storage in spherical and spheroidal tanks, operating at pressures higher than previously employed on conventional storage tanks, a practical method of sampling and temperature recording became necessary.

Always in the vanguard of progress in petroleum storage, S. & J. engineers designed the Sampling and Temperature lock shown at the right. It is mounted atop a 6″ gate valve which is normally kept closed, making it possible to affix the sampling bomb (shown below) to the stainless steel tape on the aluminum reel inside the head. With sampling bomb attached, the door is secured, gate valve opened and sampling bomb lowered to the desired level as indicated by the stainless steel tape.

Sufficient light is provided by auxiliary windows equipped with wipers, to take the temperature reading before removing the sampling bomb and exposing it to atmospheric temperature, if this is desired as a check against a subsequent reading after the sampling bomb is retrieved. Instrument lock is made of cast iron for pressures under 50 pounds and of cast steel for pressures above. Descriptive leaflet sent upon request.



The S. & J. Universal Sampler is designed to entrap a sample of liquid at any desired level and to indicate the temperature at that level.

Essentially an open cylinder when cocked, a slight jerk of the tape closes the ports and transforms it into a high pressure container with thermometer bulb immersed in the trapped sample.

Designed to operate at pressures up to 300 pounds (actually tested at 1000 pounds) it is fitted with a gate valve with high pressure fitting for emptying in the laboratory. Finished in chromium and comes complete with carrying strap. Descriptive leaflet sent upon request.

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Hydrodynamic Principle Absent In Boundary Lubrication

By A. W. Burwell* and J. A. Camelford*

This article is a reply to the criticism by Ir. G. Lieth of the third article in the series by Burwell and Camelford on Principles of Lubrication, published during recent months in NATIONAL PETROLEUM NEWS. Lieth's criticism was published in the Refining Technology Edition, Dec. 29th, 1937, page R-415.

WE ARE pleased to note that our paper has received enough attention to warrant such a detailed reply as that contributed by Ir. G. Lieth. It is noteworthy that very seldom is the classical hydrodynamic theory of lubrication so completely mastered that the principles can be applied with such facility as in the case of Mr. Lieth's contribution.

Before replying in detail to the subject matter and the conclusions arrived at by Mr. Lieth, let us briefly review the data presented, with notes on the experimental methods involved in obtaining these data. The instrument used in the determinations is known as the Lubarometer, and is an adaptation of an earlier machine built at the Brooklyn Polytechnic Institute by Professors Moore and Carvin of that college. A detailed description of the apparatus was given in this journal in the issue of August 12, 1936. We append a detail sketch of the actual bearing system, divorced from the housing used to direct the line of pressure application and to control the temperature of the system. The following points are to be particularly observed:

1. The bearing is fitted as closely as capable machine work can make it, and subsequent careful running-in is resorted to, that a full bearing surface is presented to the moving element during the entire period of the determinations of friction data.

2. The bearing is of definite width compared to the length of the journal. This implies that loss of oil at the ends of the bearing is continually accomplished, and that continuous replenishment of the lubricants supply is necessary during the period of the test.

3. The lubricant is supplied by drip to the system, so that no pressure-feed characteristics enter into the evaluation of the coefficients of kinetic friction obtained for the system. Oil grooves are not used in the bearing. A very small chamfer is provided at the leading edges of each of the bearing halves to permit entry of the oil to the bearing, but is not sufficient to allow of any wedging action.

4. Changes in pressure and temperature are accomplished at all times without shock to the system, and constant speed is a characteristic of all friction data submitted by us.

From the above, it will be seen that our aim is not to contribute to the science of full fluid film, or hydrodynamic lubrication, but rather to explore the regions beyond that in which hydrodynamic lubrication obtains. At the same time, we have wished to avoid the region of concomitant wear, and our experimental set-up has been designed for this purpose.

We have no quarrel with the laws of hydrodynamic lubrication, and freely acknowledge the excellent work which has been done in this field. Indeed, we will go even further, and express our opinion that no one can be qualified to do research work in the field of lubrication without a thorough acquaintance with the work of Tower, Reynolds, Sommerfeld and Kingsbury. However, in modern machine design, unit pressures have become so high, clearances so small, and bearings narrower for given diameter of journals, that oiliness characteristics of lubricating oils have assumed an importance unknown in the time of the enunciation of the theory of hydrodynamic lubrication.

Let us return now to the discussion of the results of our work, and the interpretation of them by Ir. Lieth. It is entirely probable that Mr. Lieth was unacquainted with the two papers which preceded that which he discussed in the columns of this journal. Otherwise, we feel sure that the criticism would not have been made that all pertinent data regarding the means of obtaining the curves given were not fully given. Temperature and coefficient of kinetic friction in the one case, and pressure and coefficient of kinetic friction in the other, were given as the only variables in the tests shown. The non-variant factors were fully and clearly enunciated.

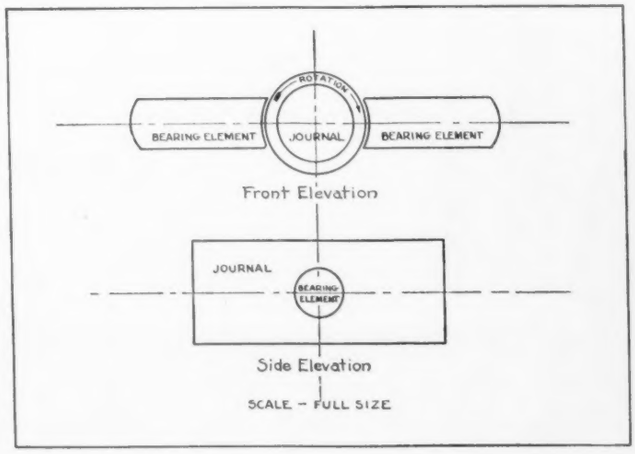
1. The bearing system was bronze on steel, and was a completely fitted partial bearing having a total area of one square inch. Metal to metal contact was not permitted during the test.

2. The journal speed was constant at 1148 r.p.m., equivalent to 500 linear feet per minute. This speed was accurately controlled at all times within one rotation per minute.

3. The rate of oil supply was constant during the test, sufficient to keep a full film at all times between the metal surfaces, (side leakage was apparent, and no attempt made to prevent it, since we were dealing with a partial bearing). The oil after use was allowed to drip clear of the system, so that oxidation or pressure-reaction products were continually removed, and fresh lubricant continuously supplied.

From these facts, it will be seen that no specific eccentricity, e/d can exist in a bearing of this type. Radii of bearing and of journal are identical making d zero. The centers of the shaft and bearing coincide hence there is no eccentricity e of the shaft in this system.

By this reasoning, the application of the curves given in Fig. 4 of Ir. Lieth's papers is not permissible. The conditions governing the accumulation of our data depart



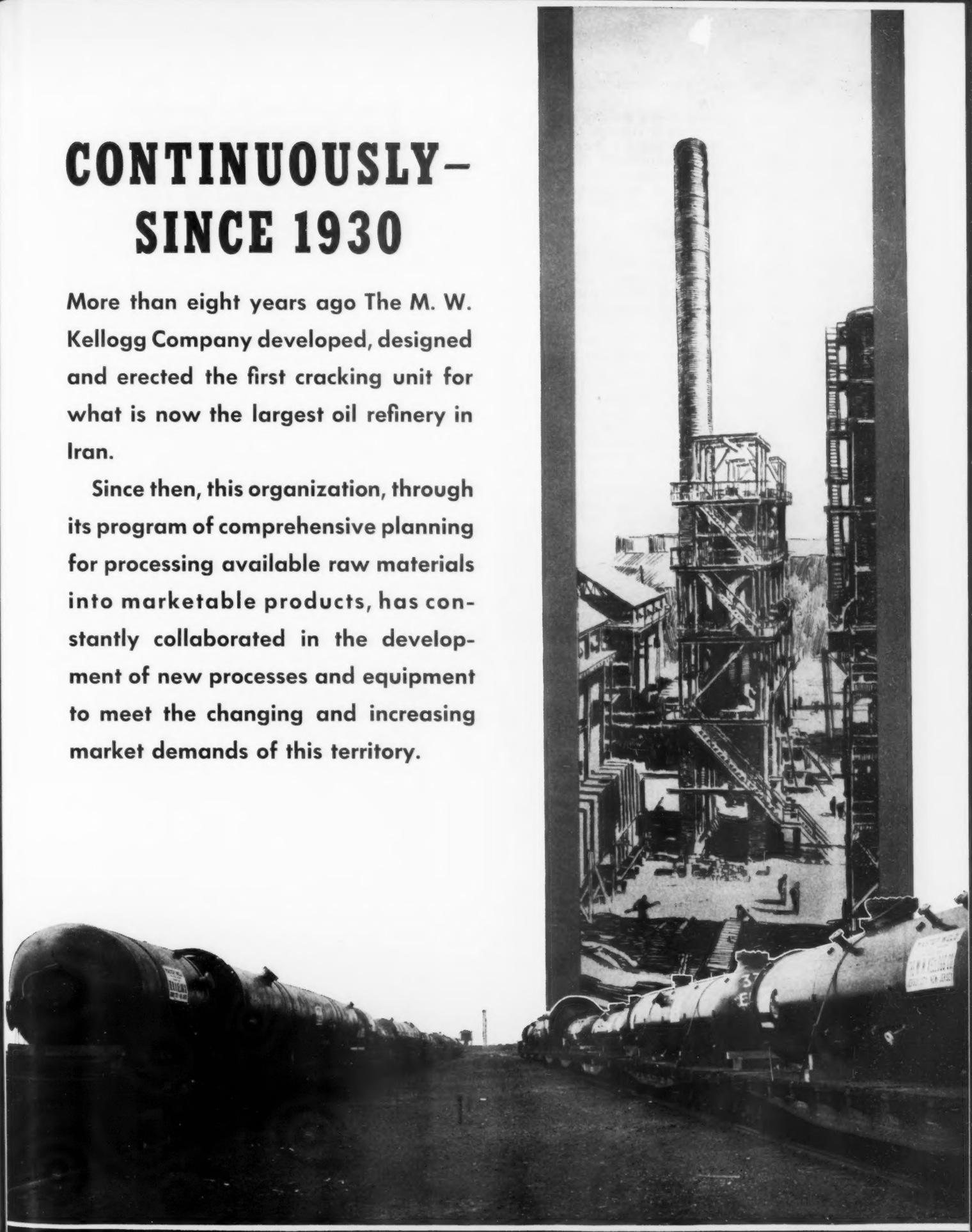
Details of the Lubarometer used in investigating boundary lubrication

*Alox Corp.

CONTINUOUSLY— SINCE 1930

More than eight years ago The M. W. Kellogg Company developed, designed and erected the first cracking unit for what is now the largest oil refinery in Iran.

Since then, this organization, through its program of comprehensive planning for processing available raw materials into marketable products, has constantly collaborated in the development of new processes and equipment to meet the changing and increasing market demands of this territory.



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radically from those required by Sommerfeld for integration.

It has for sometime been a very definite stand of the present authors that the property of viscosity in a lubricant has occupied too important a position in explanations of lubrication phenomena. The assumption is made that the viscosity of the film is always identical with that of the lubricant, determined externally at the same temperature (and in some cases, at the same pressure). In complete hydrodynamic lubrication, it is entirely probable that this is the case. Beyond that point, this premise is not justified. Where unit pressures and temperatures are high, and where clearances are very small, diffraction spectra have proved conclusively that single-component, single-phase systems do not exist, and even modification of established hydrodynamic equations to film-viscosity rather than oil-viscosity are not satisfactory.

We have endeavored to answer the remarks of Ir. Lieth as fully as possible in these notes, and hope to find that our attempt has been as complete as desired. The basic point to be established is that we attempt to eliminate conditions of full fluid film (hydrodynamic) lubrication from our experiments, and to explore the region described in the literature as boundary or thin film lubrication, defined by Hersey as "referring to the mutual action of the two adsorbed layers when there is no free liquid intervening, or at least no such liquid retaining its original bulk properties."

For a concise survey of the science of lubrication and an excellent bibliography we recommend the "Theory of Lubrication" (John Wiley & Sons, 1936) by the author (Hersey) whose definition we have quoted immediately above.

Nickel Catalyst Produces Hydrogen

Development of a new catalyst for reduction of low molecular weight hydrocarbons to hydrogen and carbon dioxide has been announced by German chemists. The catalyst is an activated nickel and reaction between steam and methane is promoted by the catalyst at temperatures of 600-800° C. (1113-1472° F.), the chemists claim.

The primary reaction is $CH_4 + H_2O$ (steam) $= CO + H_2$. After converting the carbon monoxide with more steam the hydrogen is said to be concentrated enough and pure enough for hydrogenation purposes. Methane remains in the reaction gases to the extent of 1.5 to 2%, it is stated.

In studying the synthesis of hydrocarbons from the Fischer-Tropsch reaction between steam and methane, the German chemists have developed an undisclosed catalyst more efficient and cheaper than the cobalt-thorium mass used at present, which gives corresponding yields in this process.

Corrosion Symposium Published

CLEVELAND—Four papers comprising the Symposium on Protecting Metals Against Corrosion, presented at the Detroit section meeting of the American Society for Testing Materials April 19, 1938, have been published in booklet form by the society.

The papers include one on "Corrosion-Resistant Alloys" by H. W. Gillett, Batelle Memorial Institute; another on "Protection of Base Metals by the Use of Metallic Coatings" by C. E. Heussner, Chrysler Corp.; a third on "The Pre-Treatment of Metals" by R. J. Wirshing, General Motors Corp., and a discussion on "Corrosion Protection by Means of Organic Coatings" by J. L. McLoud, Ford Motor Co.

Copies can be obtained from the society headquarters, 260 S. Broad St., Philadelphia.

Big Field for Halogenated Hydrocarbons in Coal Mining

Because of the high gravity of the halogenated hydrocarbons such as pentachlorethane and tetrabromethane, they have been adapted to a sink-and-float process of separating coal from waste materials. These hydrocarbons, being somewhat heavier than coal, allow coal to float while heavier materials such as slate, rock, and other unburnables sink to the bottom.

It was the discovery of the ability of tannic acid solution to immunize the surface of minerals against the adhesion of parting liquids that really made the entire process commercially practicable, it is said. The film of immunizing agent keeps the parting liquid from contact with the coal and waste materials to such an extent that only eight ounces—a small tumblerfull—of the parting liquid is lost per ton of material sorted.

After treatment with the "active agent" solution, the material is passed to the tank where gravity separation in the parting liquid takes place and conveyor lines carry off separated coal and refuse. All the processed material is then water-washed over shaking screens to remove the heavy liquid. The wash water, being immiscible with the parting liquid, is then easily removed in a settling basin. A small amount collects as "sludge" at the bottom and is drawn off and recovered by a steam distillation process.

Because of the adaptability of the process to other mining processes for copper, iron, lead, nickel, tin, titanium, tungsten, zinc, and even diamonds, it is said that the process may be one of the greatest forward steps ever taken by the mining industry. The process is described at greater length by W. B. Foulke in The Du Pont Magazine for September, 1938.

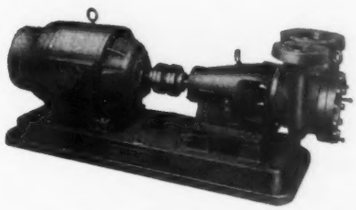
Raleigh Hortenstein was elected president of Wyatt Metal and Boiler Works, Houston and Dallas, following the death of W. J. Wyatt, company founder. He has been vice president, general manager, and a director of the company since 1923 when he came to the Wyatt organization

Activities

OF EQUIPMENT MANUFACTURERS

PUMPS—A new series of refinery process pumps built in capacities to 800 gallons per minute and heads to 400 feet is announced by Ingersoll-Rand Co. They will handle fluids at any temperature and are constructed for continuous operation on severe service, the company states.

The pump is supported by a one-piece cradle which combines the connecting piece, the bearing housing, and a water-jacketed oil reservoir. Design is such that suction and discharge connections are integral with the casing. Pumps open vertically and are self-venting. Positive lubrication of the bearings is effected by rotary discs, the oil being contained in a large water jacketed reservoir and circulated to secure thorough cooling.



The new I-R refinery process pumps Class FH and FL

Bulletin 2432 gives complete information about the new pump. Another new bulletin (No. 10,011) describes the type PVG gas engine shown for the first time at the International Petroleum Exposition at Tulsa in May. Both bulletins are obtainable at company branch offices or at 11 Broadway, New York.

* * *

CARTRIDGE DEHYDRATOR—A new cartridge dehydrator, originally designed for air conditioning and refrigeration, is finding increasing use in removing moisture from chemicals in solution and in air drying. Major features of this dryer are its perforated dispersion tube and replaceable dehydrant cartridge.

The dispersion tube extends along the center axis of the dehydrant column and exposes the entire volume of the dehydrant to penetration by the fluid or air. This construction is claimed to reduce the pressure drop, prevent channeling and resultant loss of efficiency. A compression spring seals the dispersion tube to the inlet fitting and prevents by-passing between the outside of the dehydrant cartridge and the inner surface of the dehydrator shell.

Cartridges are available charged with activated alumina, Drierite, barium oxide, calcium oxide or anhydrous calcium chloride, at the same cost. A new catalog describing the dehydrator is obtainable from the Henry Valve Co., 1001-19 N. Spaulding Avenue, Chicago.

* * *

TUBE CLEANER VALVE—A simple, inexpensive air valve just announced by the Roto Co., 154 Sussex Ave., Newark, N. J., saves time and labor by making it possible for one man to operate a tube cleaner. The new valve may be attached to any tube cleaner for straight or curved tubes 2 inches or larger. It is placed immediately behind the motor so that the operator himself can turn on and shut off the air. Use of the valve is said to reduce shut-down time.

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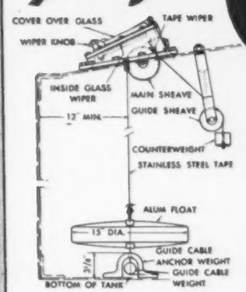

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Patent Literature OF TODAY

Fractional Distillation. N. 2 115 793, *issued May* 3, 1938; *filed Sept.* 11, 1930; *H. R. Swanson and J. S. Wallis, assignors to Foster Wheeler Corp.; 2 drawings; 9 claims.*

Quantity of stripping steam required to bring the side streams from a fractionating tower to initial boiling point and flash specifications is reduced by carrying out the stripping operation inside the fractionating tower at a zone in which the temperature is considerably higher than the temperature of the side stream being stripped. This also permits reducing the height of the tower.

* * *

Cracking. No. 2 115 794, *issued May* 3, 1938; *filed Aug.* 10, 1936; *K. Swartwood, assignor to Universal Oil Products Co.; one drawing; 2 claims.*

Charging oil is heated to vaporize selected low-boiling fractions by means of heat recovered from with the system and fractionally distilled. These fractions are recovered and subjected to cracking temperature, superatmospheric pressure and the conversion time regulated to effect high yields of anti-knock gasoline. The resulting products are introduced into an enlarged chamber where vapors and non-vaporous residue are separated. Vapors pass in indirect heat exchange with the charging stock to heat the latter as previously mentioned.

Selected higher boiling fractions of the charging stock from the distilling step are removed and commingled with the aforesaid vapors. Non-vaporous components of the commingled materials are returned directly to the enlarged chamber. Vaporous components of the commingled materials are fractionated for the formation of reflux condensate which is subjected to independently controlled conversion conditions. Resulting heated products are introduced into the enlarged chamber. Fractionated vapors of the desired end-boiling point are subjected to condensation and the resulting distillate and gas recovered and separated.

* * *

Emulsion Breaker. No. 2 115 843, *issued May* 3, 1938; *filed Oct.* 19, 1934; *O. H. Dawson, assignor to Standard Oil Development Co.; no drawing; 7 claims.*

An oil-emulsion breaking compound is prepared by washing highly aromatic distillate with alkaline material. The distillate is obtained by sulfur dioxide extraction with kerosine. The washed distillate is treated with batches of strong sulfuric acid so that batches of sludge are formed. The first batch of sludge is discarded, the others combined and free sulfuric acid removed from the combined batche of sludge.

* * *

Solvent Extraction. No. 2 115 960, *issued May* 3, 1938; *filed April* 2, 1934; *H. F. Lindeke, assignor to Shell Development Co.; no drawing; 11 claims.*

An obstacle in the way of sharp separation of naphthenic and paraffinic components by solvent extraction is solubility of oil components in various solvents depends not only on their chemical nature, but is also effected by the size of their molecules. Both raffinate and extract usually contain components of opposite groups.

A remedy is provided by separating a mineral oil first by fractional distillation into two or more fractions boiling within relatively narrow boiling ranges (preferably 54° F. or less) at a pressure of not over 1 mm. of mercury, thereby segregating molecules of approximately the same size. Each fraction is extracted separately by a method suitable to the fraction. Resulting raffinates and/or extracts are combined into desired products.

* * *

Polymerization. No. 2 116 151, *issued May* 3, 1938; *filed Feb.* 29, 1936; *V. N. Ipatieff and B. B. Corson, assignors to Universal Oil Products Co.; no drawing; one claim.*

Ethylene is subjected to the action of a solid catalyst to produce liquid polymers. The catalyst consists of a calcined mixture of a phosphoric acid and a siliceous material. The action takes place at 500-700° F. and at a pressure above 300 pounds per square inch. Time of contact is at least 300 seconds. The product is an antiknock blending fluid for low grade gasoline. See also Pat. No. 2,116,157.

* * *

Solvent Extraction. No. 2 116 188, *issued May* 3, 1938; *filed March* 13, 1934; *D. Churchill, Jr., assignor to Standard Oil Development Co.; 2 drawings; 2 claims.*

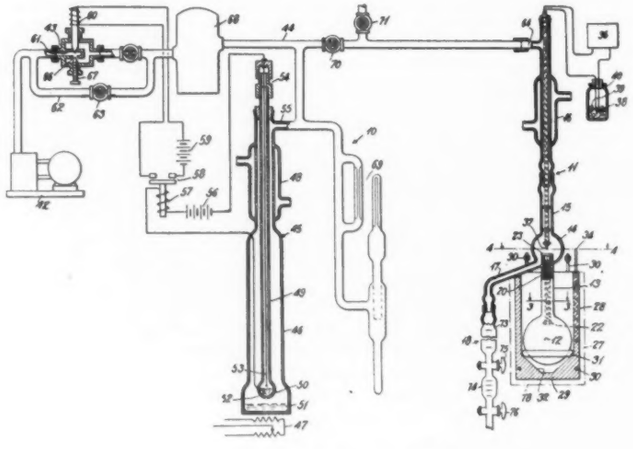
Hydrocarbon material is separated into constituent parts by extraction with a normally liquefiable gaseous hydrocarbon solvent at a temperature above the critical temperature of the solvent. Density of the solvent is varied by progressive change in pressure and by addition of a substance miscible therewith and capable of changing its density. The solvent may be any hydrocarbon having 1 to 5 carbon atoms or any mixture of these, such as methane, ethane, propane, butane, pentane, and ethylene. The density-increasing substance may be any material heavier than the solvent which is miscible with it. Suitable materials have 6 to 10 carbon atoms, such as hexane, heptane, octane, nonane, decane, hexylene, etc.

* * *

Lubricant Test. No. 2 116 442, *issued May* 3, 1938; *filed Sept.* 14, 1933; *W. B. McCluer, assignor to Pennsylvania Petroleum Research Corp.; 2 drawings, 10 charts; 3 claims.*

A small standardized quantity of oil is subjected to a low and constant standardized absolute pressure and to uniform and standardized heating conditions sufficient to cause vaporization. The quantity is such that when taken in conjunction with the pressure, vaporization of the larger part takes place without decomposition. Vapors are subjected to a standardized reflux under conditions avoiding cooling of the reflux below its boiling point and superheating.

The reflux ratio is automatically varied from infinity to zero as the distillation proceeds by contacting the vapors with a metallic element of substantial and standardized mass. Temperature of the rectified vapors is measured as successive predetermined quantities of oil are distilled over. Data thus obtained are compared with similar data obtained under identical conditions with standard reference oils.



Semi-diagrammatic view of McCluer's lubricant tester

Agrol is Political Issue In Iowa Campaign

By E. L. Barringer
N. P. N. Staff Writer

The Agrol gasoline movement at Sioux City, Ia., has once more been investigated by National Petroleum News, following a survey last February, when the Agrol promotional campaign was in full swing.

Besides the marketing aspects, the current investigation found Agrol knee deep in the congressional campaign. The following article details the Republican congressional candidate's stand on Agrol and also the general overall picture of why Agrol is a logical farm program to pit against the New Deal's farm policy.

Part 1 of this series, published in the issue of Sept. 28, covered the current marketing aspects of Agrol at Sioux City.

SIOUX CITY, Ia., Sept. 30

While the Atchison Agrol Co. is endeavoring to rehabilitate the collapsed Agrol gasoline movement in Sioux City through license agreements with blenders, establishing blending standards, and with a consumer's sales campaign, the Agrol movement now is knee deep in the current Iowa political campaign.

Both congressional candidates in the ninth Iowa district (Sioux City) have made campaign speeches regarding alcohol from farm products for motor fuel and support of Agrol is one of the planks in the Republican candidate's platform.

Congressman Vincent F. Harrington, Democrat, is up for re-election in traditionally Democratic territory and Harrington is the author of the congressional bill to exempt motor fuel containing 10 per cent or more farm alcohol from the federal 1-cent gasoline tax. So far in the current campaign Harrington has not made Agrol an issue.

Opposing Harrington is the Republican candidate Albert F. Swanson, who is making Agrol one of his major campaign issues. Swanson has been connected with a number of business enterprises in Sioux City and was a member of the Agrol committee set up early this year by the Sioux City Chamber of Commerce to promote the Agrol market. As a committee member Swanson circulated far and wide around the countryside selling the Agrol movement.

Swanson's campaign literature bristles with the Farm Chemurgic doctrine and comes out wholeheartedly for Agrol. Here is plank five in the "Swanson Program":

"Subsidies when necessary to encourage new industries that can consume products of the farm. Specifically favors remission of federal and state fuel taxes on gasoline containing 10 per cent or more of alcohol made from products of American farms."

And in the same pamphlet Swanson writes, "I am an advocate of what is known as the Farm Chemurgic program—a program designed to develop new uses and markets for the products of American farms.

"It is the soundest program in sight for the economic rehabilitation of the U. S., because it will provide work for men, land and capital.

"I am particularly interested in the development of the Agrol (agricultural alcohol) industry. Agrol is a trade name for a motor fuel composed of gasoline and alcohol.

"Agrol is a superior fuel when used in motor cars and farm implements. It is high in anti-knock qualities, yields more mileage per gallon than ordinary gasoline and provides a market for the farmers' grain which formerly went to feed work animals.

"Agricultural alcohol is no longer an experiment. It is on sale today in approximately 275 filling stations in the ninth congressional district of Iowa.

"The Department of Agriculture says that alcohol cannot be produced from 50-cent corn for less than 34 cents per gallon. But Iowa distributors are buying it for 25 cents per gallon, f.o.b. at Atchison, Kans.

"Who is wrong? Surely the manufacturers of Agrol are not such fools as to sell their product at 9 cents per gallon below cost.

"Agricultural alcohol has arrived. It is here to stay. It is going to develop into one of the nation's great industries because it is economically right and sound . . ."

The pamphlet contains another boost for the consumption of Agrol gasoline in another article stating:

"The question has been raised as to whether or not the Chemical Foundation (operating under an act of Congress limiting it to research in chemistry) can erect a second alcohol plant. There are those who will use every means to prevent the erection of any more alcohol plants, but remember the Foundation has done the research; now is able to supply us with more than 10,000 gallons of alcohol per day.

"That fact makes it possible for us to demand Agrol from our dealers. The government can help but if the motorists and truckers of northwest Iowa alone will demand Agrol of their dealers it will take five plants the size of the one contemplated for Sioux City to supply this demand, and there will be plenty of companies willing to supply the alcohol.

"There is one time when we are the boss; that is when we are the buyers. No corporation on earth is large enough to fight its own customers. Will you do your part? Don't say gas, say AGROL."

The pamphlet discusses the Farm Chemurgic program in two pages, giving much of the standard information that has been presented to the public. The argument of Agrol advocates that Agrol is a superior motor fuel is con-

This French tourist in a service station at Ljubjana, Jugoslavia, has to take aboard a load of alcohol gasoline because a 20 per cent blend is required in Jugoslavia, but the attendant places a felt pad around the gasoline tank fill line to protect the finish in case any of the blend spatters

tained in the discussion stating: "The reason Agrol should sell for 1 cent more per gallon than regular gasoline is that at 1 cent more it is competitive. That is if a gallon of regular gasoline sells for 18 cents and drives your car 18 miles, then a gallon of Agrol which would drive your car 19 miles should sell for 19 cents."

So far in the whole farm alcohol-motor fuel movement, the political angle has been promotion of consumption of alcohol blends through exempting that from gasoline taxes.

Observers point to such a law now in effect in Nebraska on a state gasoline tax and to the Harrington bill that was introduced in Congress to exempt from the federal tax motor fuel containing 10 per cent or more of farm alcohol.

Observers point to the signs that Congress will still be run by the Democrats, in spite of the Republican anticipated gains in the forthcoming elections. Also, that the Farm Chemurgic program is based on finding uses for a farm surplus, while the Democrats now in the legislative saddle have a farm program of scarcity, not of a surplus.

Shrewd political observers of the Iowa ballot boxes, in appraising the general state wide Agrol-in-politics movement, point to the Iowa Republican platform as being opportunist in taking up the cudgel for Agrol gasoline. There was this statement in the platform:

"Laws favorable to new uses for farm products in industry should be passed at once, both in state and nation, and new crops should be developed as substitutes for commodities now imported, and intensive research should be carried on toward that end."

That is where Agrol fits neatly into the picture, political observers forecast. The Agrol program is based on the use of the farmer's surplus products and is the opposite to the New Deal's farm program, so Agrol makes a good farm platform for the opposition.

Getting back now to Iowa's ninth congressional district, no matter which candidate wins the district will have a power alcohol man in congress—Harrington who fathered a bill to exempt 10 per cent blends from the federal gasoline tax, or Swanson who has such a plank in his platform.

To find out the importance of alcohol-gasoline motor fuel in Iowa politics, former Senator L. J. Dickinson, now running for U. S. Senator on the Republican ticket in Iowa, enclosed a question on it in a recent questionnaire sent to precinct committee men and women.

Twenty-two subjects were listed and each subject was to be marked "yes" or "no" as to its importance in the committeeman's precinct. Question 14 was "Industrial use for farm products."

Returns so far have been 513 out of a 4100 mailing. Of the 413 returns, 215 voted this subject was of little interest in the precinct, 298 voted that it was. The "yes" vote was heavy from the Sioux City area, of course.

Store Front Display Windows In Modern Stucco Stations

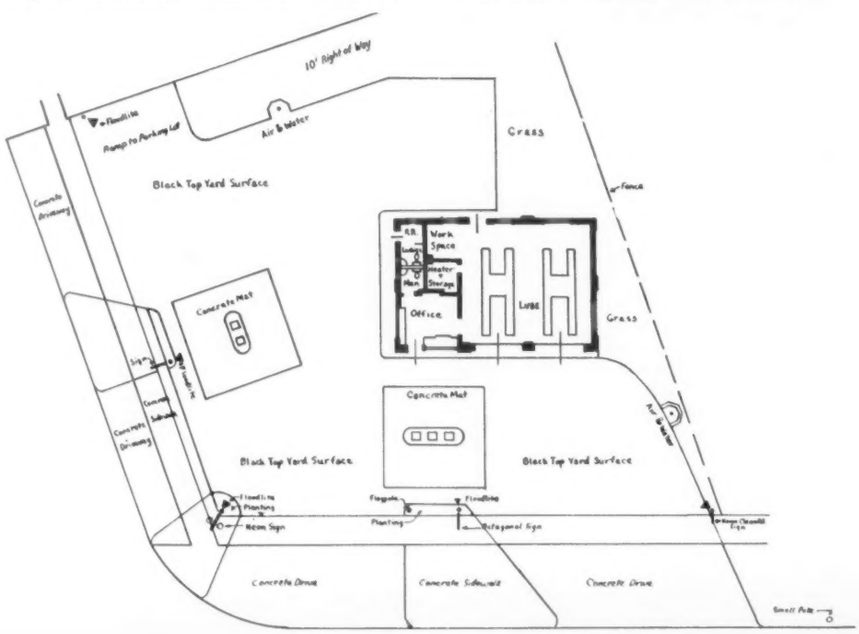
THIS trim looking station, operated by the Shell Union Oil Corp. at Syracuse, N. Y., is entirely constructed with an exterior of stucco on concrete block, including the pilasters, coping, ornamental band course, and chimney. The finish coat is colored integrally to match the company's standard cream color, and is floated.

Wood rafters, roof deck and stud partitions are used. Lintels and girders are steel. The roof has three plies of tar and felt with a gravel finish, and with copper flashing and counter flashing. Floors throughout are four-inch reinforced concrete slab, with a one-inch monolithic finish treated with red hardener. Walls and ceilings are covered with ½-inch wall board having a wood closure mold at the ceiling.

Steel commercial fixed sash with hinged vents are used, except for the display windows, which are of store front construction. Polished plate glass is used in the office doors and windows.

The built-in equipment consists of a desk, cabinets, show cases, shelving, work bench, implement rack, and tool boards. The interior and exterior door trim is wood, as are all doors. The lubritorium doors are of the overhead high-track type, with glazed panels.

The building exterior is cream, with a 12-inch base of red, a 4-inch yellow band above and a ½-inch red stripe. All exterior heads, jambs, doors and sash are painted yellow. The interior walls of the lubritorium and wash rooms are cream with a brown dado 3½ feet high. Signs have yellow background with red lettering and borders. The driveways are black top surface, except for large-sized concrete mats on which the two pump islands are set.



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Majors' Support Needed To Enforce Price Laws

An interview with Joseph L. McLaughlin, director of the division of motor fuels of the New Jersey tax department, who is in charge of the enforcement as to gasoline of the price control laws passed by that state in June.

THE only way that fair trade laws can be made workable in the retail gasoline industry is for the supplying companies "to take a firm stand on the sacredness of their contracts with dealers, and by the cooperation of all major companies by the posting of resale prices for their branded gasoline."

This is the opinion of Joseph L. McLaughlin, director of the division of motor fuels of the New Jersey State tax department, who has been in charge of policing the operations of dealers under the New Jersey price control laws since they were adopted June 1 of this year. McLaughlin stated his opinion in an interview in the division's offices in Trenton recently.

Explaining how his department fell heir to the enforcement of the New Jersey law, McLaughlin said it was natural for its enforcement to fall within the duties of the motor fuel tax division, inasmuch as it is difficult to separate the work of tax inspection and control law inspection.

He said that 23 state inspectors who had been working on tax enforcement, and 24 other paid inspectors were put into the field in New Jersey immediately following the enactment of the law on June 1.

The work of inspectors is held only to compliance of regulations pertaining to selling below cost, discounting under posted prices, price signs and price posting, the prohibition of lotteries, prizes and games of chance in connection with the sale of gasoline, and keeping of records.

The motor fuels tax division, McLaughlin said, has not, and will not concern itself with compliance under Chapter 165 of public laws of 1938. This is the statute under which a seller of a branded gasoline may stipulate the retail price at which it is to be sold.

The division's inspectors, however, have made spot checks of dealers selling branded gasoline to determine if the margin between the dealer's tank wagon price and the stipulated price in the dealer's contract was sufficient to escape the provisions of the law, wherein the sale price must not be below the cost of the product plus all selling expenses. In every event, he stated, the margin was sufficient to sustain all expenses.

The policing of the fair trade price law, he stated, was a matter for the dealer or any other person who might be injured by the failure of a dealer

NAME OF RETAIL DEALER _____ DATE _____

DAILY SALES RECORD

PRODUCT SOLD	Number of Gallons or Units Sold	Unit Sales Price	Total Daily Sales Revenue
GASOLINE—Regular			
—Ethyl			
—Third Grade			
LUBRICATING OILS—First Grade			
—Second Grade			
—Third Grade			
KEROSENE			
ALCOHOL			
ANTI-FREEZE			
OTHER LIQUIDS (Product)			
TIRES (Grade)			
TUBES (Grade)			
BATTERIES (Grade)			
OTHER ACCESSORIES (Type)			
SERVICE JOBS—Washing			
—Tire Repair			
—Chassis Lubrication			
—Trans. and Rear End			
OTHER JOBS (Type)			
TOTAL ALL OTHER PRODUCTS SOLD			

NAME OF RETAIL DEALER _____ MONTH OF _____

EXPENSE RECORD

ITEMS	MONTHLY TOTAL
1. Withdrawals by proprietor or partners	$
2. Salaries of Employees	
3. Rent	
4. Telephone and Telegraph	
5. Light, Heat and Power	
6. Repairs	
7. Stationery and Postage	
8. Advertising	
9. Station Supplies	
10. Delivery Expense	
11. Insurance	
12. Taxes—other than Motor Fuel Taxes	
13. Social Security payments	
14. Bad Debts	
15. Depreciation	
16. Interest	
17. Miscellaneous Expenses	
(a)	
(b)	
(c)	
(d)	
(e)	
(f)	
(g)	
(h)	
(i)	
(j)	
(k)	
(l)	
(m)	
(n)	
(o)	
(p)	
TOTAL EXPENSE	$

NOTE—Miscellaneous Expenses includes entertainment, charity, laundry or any other Expense not specifically set forth. List each item individually

When the fair price law in New Jersey was passed in June, the division of motor fuels of the state tax department sent to each dealer a specimen record form for keeping track of daily sales not only of gasoline but of other commodities as well, which is prescribed by the law

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to comply with the law. He also added that it was impossible to enforce this section of the statutes until all suppliers have posted prices.

At the outset, all dealers within New Jersey were sent a copy of the regulations contained in the law, and a list of 12 "musts". The regulations and the "must" list interpret the control law and the list sent to dealers was handed, "Things for you to do on and after June 1." Points on the dealer's list were as follows:

"1. Post price signs on each of your pumps as set forth in Regulation No. 1 attached."

Under this regulation price signs at least 5½ by 8 inches must be attached to the pump showing the unit price per gallon, which is to include all taxes imposed.

"2. The posted price must be at least your cost plus all selling expenses."

Article 2 of the state law reads; "No retail dealer shall sell motor fuels at a price which is below the net cost of such motor fuel to the retail dealer plus all selling expenses."

"3. Once you post a price, keep it posted and in effect at least 24 hours."

"4. Sell at no other price except that posted."

"5. If you have any price signs other than those on your pumps be sure they conform with the provisions of Par. 9 of Reg. No. 1. If they do not, change them, or remove them."

"6. If you advertise the price for your fuels in newspapers, radio or through any other medium, comply strictly with the provisions set forth in Par. 10 of Reg. No. 1."

"7. Give no rebates, allowances, concessions or benefits of any kind whatsoever on sales of motor fuels."

"8. Use no lotteries, prizes, wheels of fortune, punchboards or other games of chance in connection with your sales of motor fuels."

"9. Put on the housing of each of your pumps the brand name or trademark of the fuel dispensed from it. Also put them on all above-ground storage tanks. If your fuels have no brand name or trade-mark, use the words 'No Brand.' Put them on as set forth in Reg. No. 2 attached."

"10. Do not substitute one grade of motor fuel for another."

"11. Start on June 1st to keep complete and accurate records from which can readily be ascertained the net cost to you of all motor fuels which you have sold and, in addition, your selling expenses, including all overhead and general business expenses."

The department sent to each dealer a specimen of the type records to be kept upder its regulations. The specimen, which is reproduced below, calls for the daily record of all sales of accessories, as well as motor fuels.

"12. Any person desiring to report violations of the laws or regulations should do so in writing. Verbal or anonymous complaints will not be acted upon."

McLaughlin reiterated that the division is rigidly refraining from giving any consideration to verbal or anonymous complaints.

After the dealers were appraised of the regulations under the new law with which they were to comply, the 47 inspectors — which number, incidentally is expected to be increased in the future, and which will be paid from the revenue raising feature of the law— took the field.

Only two arrests have actually been made so far in New Jersey, it was stated, and both were for discounting, or selling below the price posted. The director would not discuss these cases, except to say that the department was looking forward to the test of the law in court, and that much time and consideration was being spent in preparation of the initial court test. Since this interview with McLaughlin, one of these cases has been decided in court, the dealer being found guilty and fined $50.

The first action taken by a state inspector in the cases of complaints of violations, or where a violation is found, is to give the station employe, or owner a warning ticket. This ticket, a copy of which is retained in the files of the division of motor fuels, provides space for outlining of the offense, and states whether it is a violation of the motor fuel tax law, or the control law. Offenders are asked to correct the situation and avoid a repetition.

All warning tickets are followed up at stated intervals to determine whether the law is then being complied with. It was stated that the warning tickets serve a two-fold purpose. Besides calling attention more forcefully than a verbal warning, they provide the department with evidence which, while not tested in courts, is written proof of an offenders' ignoring the warning of the division's inspectors.

McLaughlin said that 90 per cent of the warning tickets issued so far have brought about desired results.

Another method of obtaining compliance to the control features of the law is calling attention to the offender that the division is empowered under the tax act to revoke the license of any dealer "for any reasonable grounds". Non-compliance of the control law, without court test, is now considered reasonable ground for the revocation of license by the motor fuel division.

McLaughlin, citing an incident showing the power the division has with the threat of revoking license, related that the division had issued an order requesting a company which had failed to comply with a price sign regulation and had ignored repeated warnings, to show cause why its license should not be revoked. Before the officer who served the show-cause order returned, an official of the company called at the division's office in person to find out what must be complied with, and what could be done to straighten out the matter.

Inspectors have gone into service stations—generally private brand stations—McLaughlin said, to determine at what minimum price a particular station could sell gasoline. The department, he added, has attempted to develop formulae for different types of locations based on sound accounting principles, although as yet the system has not been completed, nor its merit tested.

McLaughlin emphasized that division inspectors have been cautioned to use extreme diligence and care in their work, so that the law cannot be taken into court on any overt act of the division under which the law is regulated and policed.

U. S. Patent Office Supports Pure Oil On 'Puritan' Mark

N. P. N. News Bureau

WASHINGTON, Sept. 30.—U. S. Patent Office rulings on trade mark oppositions in the cases involving oil products and two oil burner companies have been handed down as follows:

Commissioner held Pure Oil Co. entitled to register term "Puritan" as a trade mark for oil products. Registration opposed by Puritan Soap Co., Rochester, N. Y., which claimed prior use of term for its products. Commissioner ruled the products of the two companies are entirely different, hence there would not be confusion from that standpoint, and also held that "Puritan is too common a word to signify any particular corporation of whose name it is only a part." Soap company had contended public thought of it when it saw the term "Puritan."

Held Syncromatic Air Conditioning Corp., Milwaukee, not entitled to register term "Syncromatic" as a trade-mark for air conditioning system because of prior use by Williams Oil-O-Matic Heating Corp., Bloomington, Ill., of the term "Air-O-matic" as applied to the same goods. Terms held too similar to permit registration of Syncromatic.

Held that Morse, Lockhart & Morse, Inc., Boston, entitled to register term "Firomatic" as trademark for fuel control valves despite opposition from the Williams Oil-O-Matic.

Cities Service Adds to Legal Staff

N. P. N. News Bureau

TULSA, Sept. 30.—Three new members have been added to the legal staff of the Cities Service Oil Co., A. M. Ebright, general counsel, has announced. They are:

Ronald E. Boynton, former attorney general of Kansas; Robert Mason, University of Oklahoma graduate and recently in private practice at McPherson, Kan.; and O. R. Stites, former attorney for the federal trade commission.

D. A. Cripps and S. N. Hawks recently retired from the staff, while Glenn Clark has been transferred to Kansas City as general attorney for the Panhandle Eastern Pipeline Co., and James Stanley went to New York as chief counsel for the Brewers association.

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Profits from gasoline are getting thinner and thinner. Oil and "lube" sales do not always cover costs and pay a profit. If you do not supply your present customers with tires, someone else will. The Giant plan will help you profit from business now rolling through your dealers' stations.

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Preparing Tank Trucks For Repainting

By Arthur P. Schulze*

Steam cleaning does a fast, effective, low-cost stripping job on tank trucks. Surfaces are left in excellent condition for repainting

SUB-ZERO temperatures, rainy seasons, the scorching rays of the sun, and other variable weather conditions work havoc on delivery trucks, tank cars and other rolling equipment by causing deterioration of paint, varnish, lacquer, enamel and other protective finishes. The failure of the coating by chalking, crazing, peeling, or becoming blotchy due to scratches or dented by accidents, requires the complete removal of the finish if subsequent coats are to give the maximum in equipment protection and appearance.

When these conditions exist, repainting over the old finish is no longer practical if appearance is not to be sacrificed, and stripping the surface down to the bare metal is thus imperative. Experience has shown that only then will future finishes provide the protection and attractive appearance rightfully expected of them.

* Oakite Products, Inc., New York.

In some instances, stripping the old finish is a matter of economy even when the paint surface appears to be in good condition. Such was the case with one tank car operator, for example, who found that in preparing his equipment for repainting simply by hand scraping, followed by washing down with kerosine or similar solvent, certain grave difficulties were encountered.

While this fire hazardous method produced a fairly clean surface for the future coat of paint, it was found that rolling equipment cleaned this way often required repainting at more frequent intervals than new units where the paint had been applied on the original clean metal surface. Investigation revealed the cause of this condition to be rust which formed under the old paint but had not eaten through sufficiently to be noticeable on the old paint coat surface.

At the time of repainting, this portion of the old paint appeared to be in perfect condition, but within a period ranging from six months to a year, the underlying rust film had lifted both the old and the new paint. The consequent result, in many instances, was that the equipment had to be repainted much sooner than would have been necessary if the old paint had been removed entirely and the rusted surfaces cleaned down to the bare metal.

This operation of removing the entire coating previously applied and exposing the original surface for retreatment is a process that has long been a difficult problem with which petroleum transporters, truck fleet operators and tank car owners have been beset.

While there are several methods by which this stripping process can be effectively accomplished, many of them commonly used heretofore have proved in actual practice to be unsatisfactory for one reason or another.

ONE method is the use of a regular paint and varnish remover, which is applied with a brush and allowed to soak, after which the sticky mass is removed with a scraper, putty knife, or similar sharp-edged instrument. With this familiarly known process, application of several coats of solvent may be necessary, and considerable time required to remove the old finish. Not only is this method high in cost, both from the material and labor standpoint, but also it creates a distinct fire hazard, caused by the highly inflammable nature of the medium used. Only a small spark may be necessary to immediately set the treated equipment in a blaze.

Another method is that of sand blasting, which requires extensive and expensive equipment. Contributory to the high cost of this procedure are the cost of sand, compressed air, and the various difficulties encountered in using wet sand. There is always the possibility of sand and dust becoming lodged in the mechanism of the vehicle . . . an obstacle which, in many instances, is of sufficient importance to condemn the application of the system. Despite these disadvantages, which should also include the well-known health hazard of silicosis to workmen, sand blasting is employed mostly in plants where the heavy initial investment was made years ago, and the only expense now chargeable to it is current supply costs.

In summarizing these methods, it may be concluded that:

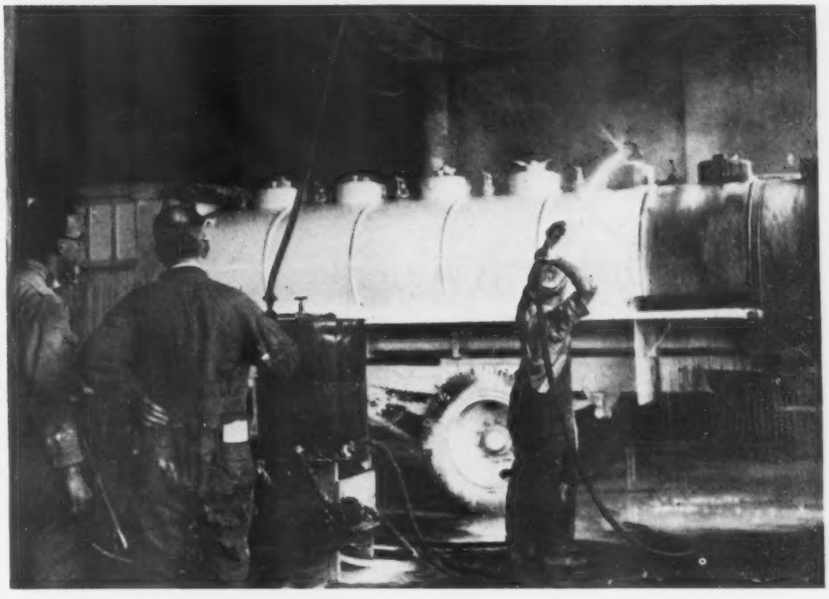
(1) The effective results secured with paint and varnish removers are generally outweighed by the cost of the material and labor necessary in stripping the finish, and in the constant fire hazard involved.

(2) The effective results obtained by sand blasting are cancelled, figuratively speaking, by its

expense and its creation of the generally recognized occupational hazard of silicosis associated with it.

In the light of these facts, improved paint removers were needed. Truck fleet operators and others who strip paint regularly gradually formed definite opinions as to what features such materials should incorporate. A paint stripping product, it was felt, should be economical, quick and effective, entirely safe to use, and more particularly, be so practical that it could be applicable in any shop, large or small.

DEVELOPMENTS over the course of the past few years in improved paint stripping technique have satisfactorily met these requirements. Progress in this direction has been so rapid, in fact, that there are now three commonly practiced methods available to petroleum transporters and other truck fleet operators for doing this work with new speed, safety and effectiveness.



Where the use of hot solutions is impractical, cold stripping can be employed advantageously. Simply applied, cold strip material is allowed to soak for 15 to 30 minutes. Rinsing then carries away from three to six coats of paint

Cold Stripping

The recent development of a specially compounded alkaline material used in water solution has made entirely practical the complete removal of paint from gasoline and fuel oil delivery trucks and other rolling equipment without the dangers involved in the use of volatile paint removers or without the need for heat. It is applied cold. The material is simply dissolved in cold water, forming a solution of paste consistency, which can be either brushed, swabbed, or sprayed on the surfaces to be stripped. The method of application depends upon two factors, the volume of work scheduled and the size of the equipment to be treated.

In most cases where cold stripping is used, however, gasoline delivery truck bodies, truck tanks and tank cars are stripped simply by spraying the surface to be treated with the cold-strip solution, much in the manner of spray painting. The solution is therefore applied evenly and rapidly. Only from two to five minutes are generally required to completely coat one side of a truck with stripping solution.

After allowing the solution to soak into the paint from 15 minutes to a half hour, the softened coating, like soft mud, is washed away by thoroughly rinsing off the surface with plain water applied under the highest pressure readily available. By this method, it is practically possible to remove from three to six coats of paint or synthetic enamel in one application, depending upon the particular type of finish that had been applied. For removing heavier accumulations of paint, the cold-strip operation is repeated until the bare metal surface is reached.

The cold-strip process is effective on all paints and synthetic lacquers, but will not remove true lacquered finishes. Where lacquer is the base material under the subsequent finish, it must be removed independently by the use of a suitable solvent or by the hot flow-on method, described later.

Where many paint coats, built-up on a lacquer base, are to be removed, the best practice appears to be the use of a combination method, employing the cold-strip process to remove the paint, and the solvent to remove the lacquer. It is reported that considerable time and labor is saved when this procedure is followed, as against the use of solvent alone.

Steam Cleaning

If steam pressure of ten pounds or more is available, or where any of the commercial steam cleaning equipments have been installed, it has been found that effective paint stripping results are speedily accomplished with the steam spray. The tank is charged with an alkaline stripper especially developed for use in hot solutions. Depending on the nature of the finish to be removed, this material is used at a concentration of from four to eight ounces per gallon of water.

MANY fleet supervisors and maintenance superintendents have found repeatedly that, when using this method, maximum results are obtained by concentrating the solution on one area after another until all of the paint is loosened, after which the surface treated can be adequately rinsed by shutting off the stripping solution valve and applying the steam alone.

Removing paint with steam cleaning equipment is entirely practical, and its use is quite general because of the availability of the needed equipment in many shops. It is the most suitable and most economical method except where a large volume of work is to be done. In those instances, the following practice has proved extremely effective and economical.

The Hot Flow-On Method

In those cases where paint stripping is a regularly practiced operation on a production basis or whenever an extensive stripping program is to be carried out, a different method of paint removal has proved exceptionally advantageous, known as the hot flow-on method, a comparatively new patented procedure.

Utilizing a boiling solution of a stripping material designed for use with this method, made up in a central tank or reservoir in the proportion of eight ounces of material per gallon of water, this procedure provides for flowing the hot solution through a spray head or distributing rake placed atop the surfaces to be stripped. This allows the stripping solution to drain down the sides of the tank car, tank truck or other rolling equipment, loosening and carrying away with it every trace of paint.

Provision is made for reclaiming the stripping solution by running it to a sump tank or a catchpan from which it can be pumped for re-use. A practical, accurate method is provided for making additions to the solution, when necessary.

A typical example of the advantages secured with the hot flow-on method, in comparison with less modern paint stripping procedures, is offered by the experience of a large refining and marketing organization.

Considerable paint stripping is done in this company's garage in a mid-western city. All the equipment used for this work was "home made" or salvaged from piping, hose and other

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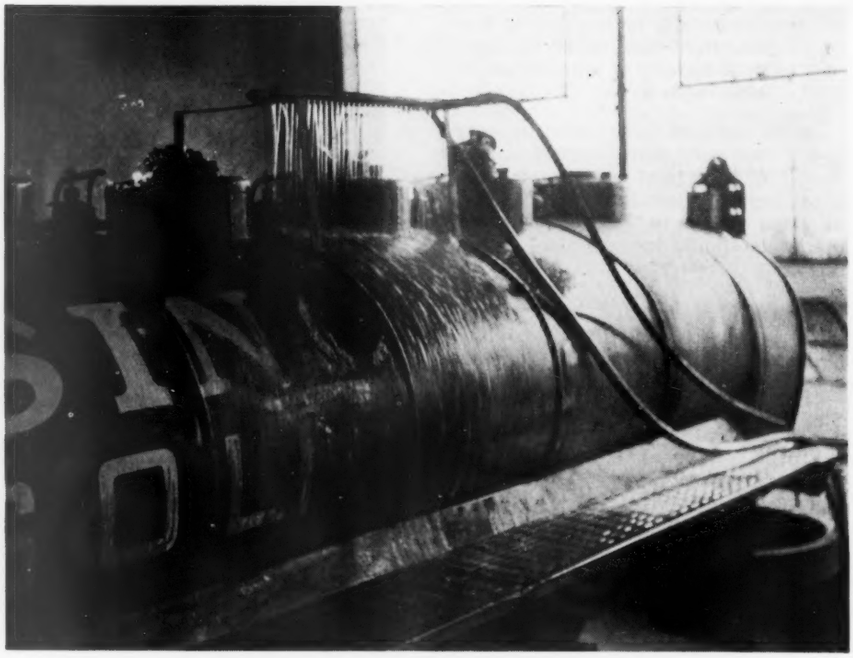

Here is a truck tank being stripped by the hot flow-on method. Some installations of this type have rakes the full tank length so all paint is stripped at one time

temporarily discarded parts lying about the shop.

The stripping solution is held in a 300-gallon cylindrical tank 15 feet above the floor level and is heated by live steam supplied by a small boiler. By a gravity flow, the boiling solution runs down in a ⅝-inch diameter hose, through a flat nozzle 1¼ inch x ⅛ inch, over the painted surface of the tank or truck to be stripped.

The solution then runs down on to the floor where a five-gallon can placed in the sump catches it. As the solution rises in the can, a pump forces it back into the large solution tank overhead, where it is heated for re-use over and over again. Loss of solution is thus kept at an exceedingly low point.

After a gasoline or fuel oil tank or truck is stripped, it is immediately given a thorough, high-pressure hose rinse to remove any stripping films or other foreign matter that might interfere with the new finish coat. In those cases where individual sections of the vehicle, such as the cab, chassis, wheels, fuel pipe line, etc., do not require stripping, they are protected or shielded from the solution by large steel sheets. The only hand scraping or labor involved was in the removal of the metallic film trademark transfer.

With this procedure, 105 trucks were stripped in this shop last year. Forty units have been treated so far this year. This company's experience reveals that; when paint remover and hand scraping had been resorted to, the removal of several coats of synthetic and special gasoline-kerosine resistant enamels took usually from four to eight hours with two men on the job. Stripping large units often required more time.

Now, trucks generally can be stripped in from 15 to 30 minutes by one man. A 500-gallon truck in one instance took only 30 minutes. In another case, a 750-gallon unit was stripped in 20 minutes. A fuel oil truck with a tank of 2500 gallons capacity was stripped bare, down to the metal, in 40 minutes.

While there is a time variance on each job due to such factors as the number of coats and the exact type of finish to be removed, the temperature at which the solution is applied, and the volume of flow, it has been found in most instances that even larger units than the examples cited can be effectively stripped inside of an hour.

This company is regularly securing consistently effective paint stripping results at a cost said to be one-fifth of that formerly encountered. An incidental advantage gained with hot-stripping is that the underlying blue annealed steel surface of the stripped units is not scratched as had been the case formerly, thus providing an improved bond for the subsequent paint. Due to the smoother surface thus secured, fewer coats of the new paint are needed, so that costs are also reduced in this respect.

Anson Heads Ben Franklin Refinery

N. P. N. News Bureau

TULSA, Sept. 30.—I. A. Anson of the Bell Oil & Gas Co., who has been in charge of the company's refinery for several months at Grandfield, Okla., has been made general manager of the Ben Franklin Refining Co. at Ardmore, Okla. The latter plant is the old Wirt Franklin Petroleum Corp.'s plant which is being rehabilitated to operate on Healaldton crude. Bell will be marketing agent for the company.

Handling Losses Could be Halved

Bulk Plant Inspection Shows

Losses at bulk plants that appear too small to give attention to, when considered in the light of individual or daily operation, have a different complexion when calculated on a yearly basis. This is particularly true in the case of equipment to check evaporation losses, is the experience of an NPN staff writer, who has been checking plants with an NPN Inspection form.

With an investment of possibly not over $1500, including meters, it was figured that the present loss at this plant could be reduced to half that amount, thereby adding over $700 a year to the plant's income. A small leak by drops around a pump, which could have been eliminated without expense, was figured to amount to a loss of $7 to $8 a year.

DEFICIENCY in only a few items as measured by the NPN Bulk Plant Inspection Form, costs one typical bulk plant in northern Ohio over $700 per year, it has been estimated. This estimate is based upon comparison with modern plants of similar capacity in which the percentage loss of gasoline from all causes has been reduced to one-half the proportion at this plant.

One whole tank car of gasoline, now lost in one way or another at this plant, could be turned into profit if the methods of handling and the equipment of leading operators were duplicated here. The present loss of nearly 19,000 gallons per year might just as well be 9500 gallons. The other 9500 gallons saved, if only worth 7.5 cents per gallon delivered to the bulk plant, would add over $700 to the annual income. Total annual throughput of the plant is close to 1,500,000 gallons.

Assuming the cost of modernizing a plant to make this possible is $2500 the dividend on the investment after deducting a 10 per cent depreciation per year is 18 per cent. While this is an excellent profit, it is probable that the investment required to produce this saving in handling loss could be under $1500, assuming the tanks required no attention. This would include three meters, eliminating the necessity to open the gage hatch and release built-up pressure as well as providing other advantages. Profit on this basis, with a ten-year write-off, would be between 35 and 40 per cent. Most bulk plant tanks are found satisfactory, according to one manufacturer, and pressures of two pounds or more have been safely put upon tanks of the size ordinarily used at bulk plants.

"To obtain the greatest possible saving while operating a bulk station tank under pressure it would be necessary to equip the tank either with an automatic gaging device or with a liquid meter, permitting the operator to determine the liquid contents of the tank without opening the gage or thief hatch," according to Bureau of Mines Technical Paper 565 on Reduction of Evaporation Losses from Gasoline Bulk-Storage Stations.

Neither pressure-vacuum relief valves nor liquid meters are a part of this plant figuring in an NPN inspection. In spite of this lack, now considered vital to many plants so equipped, the plant as a whole received a relatively high rating by the NPN method. The 86 per cent rating indicates some divisions of the question-

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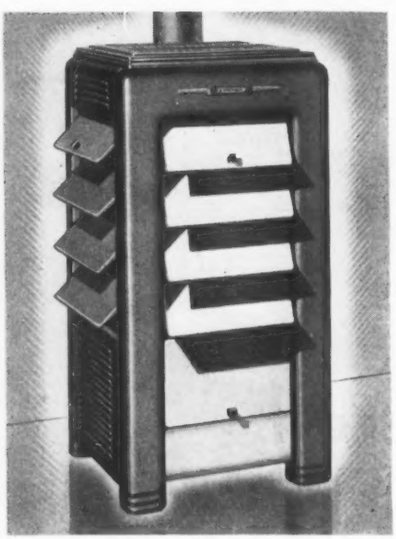

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naire were quite satisfactorily answered.

The fire fighting equipment rated nearly 100 per cent and was above the average found at independent bulk stations; perhaps the best protected plant yet come across in visits to numerous plants in the area. There is a reason for this, it was learned later. Fire protection questionnaire reports, similar but far more detailed than in that division of the NPN inspection form, are provided plant operators.

In keeping with the excellent fire protection equipment, it was found that fire prevention measures as far as equipment is concerned were also 100 per cent in quality. This was evident in the pump house by the condition of the motor and particularly the wiring, which was a Class I job in pipe conduit with no exposed wiring at any point. Precautions in wiring were carried into the garage and warehouse, where all wires were also in conduit and all lighting fixtures were protected and none were hanging loose. This type of installation might be thought to be nothing extraordinary but visits to many bulk plants have shown the contrary to be the rule.

THE tank truck loading rack was apparently in good condition, it appeared at first glance, but closer inspection disclosed the bursted end on a tank. Since this mishap, gravity loading of trucks has been abandoned and trucks are loaded by pumping direct from storage tanks. In every instance where bursted tanks or tanks leaking at the seams have been found on NPN inspections there have been questionable methods of installing equipment, such as lack of a by-pass valve on the pump. These tanks do not have overflow lines back to storage. Now that the loading tanks are not used the lack of necessity for the extra handling is appreciated.

Typical of many bulk plants, the loading rack at this plant has no canopy, thus requiring the truckman to stand out in all kinds of weather. Another practice here is the use of loading hose instead of loading arms. Some at various plants have been observed with delivery nozzles equipped with self-closing valves on the end and some with all valves in the piping.

The question of economic loading time in connection with pumping efficiency is considered by one authority who has made a close study of truck schedules to be a secondary consideration except under conditions where one truck has to wait on another. In other words the gradual drop in pumping efficiency is not so important from a delivery schedule standpoint. A common pumping rate of 75 to 100 gallons per minute flow in small bulk plants is satisfactory. Efforts in well managed plants are concentrated on efficient delivering schedules and pumphouse maintenance is aimed chiefly at prevention of pump or motor failure

and elimination of leaks at any points.

With the increasing use of transport trucks in delivering gasoline and other oils to bulk plants, some of the railway sidings are being neglected. Such was the case at this northern Ohio plant. Rails were corroded and the track bumpy. Ballast had not been touched for years apparently.

The yard at this plant was well kept. It would be an exaggeration to say there were no chuck holes in the drive but they were not large and did not reflect seriously upon the plant, considering the more than average wet weather. Being the season for high weeds, it was noted few were allowed to grow near the tanks or anywhere that would affect the plant's rating. Some discarded equipment laying in the yard, however, took nearly 0.6 per cent off the score.

The tank score suffered somewhat because of the lack of pressure-vacuum relief valves and vent screens. There was also evidence of leakage at sometime at the seams. The need for paint was obvious both from the standpoint of discoloration and rust at points where paint has chipped off.

Leaks and evidence of former leaks were observed around the pump. One of the leaks had a varying rate up to 60 drops per minute depending upon whether the pump was running or not. The assumption of a drop size slightly larger than one-eighth inch diameter and an average of rate of 40 drops per minute takes 85 gallons out of storage in a year and $7 from profits at 7.5 cents per gallon or $8 or $9 if delivered costs are higher.

Warehouse and garage both at one plant is not common at many of the smaller bulk plants. Both were well maintained and orderly at this plant. Provision of vents at the base of side walls of the garage was the only omission to lower the rating.

Recalls Lard Oil Lubricant Days

CHICAGO, Sept. 30.—The 47-year connection of Walter E. Marble with D. A. Stuart Oil Co., was celebrated recently with a testimonial dinner on his 80th birthday. The dinner was given by 25 of Mr. Marble's old time friends and business associates.

Recalling how employers in the 1880's and 90's rigged out their salesmen with well-groomed horses and rigs, he observed that the horses were at least wiser than the high-powered cars of today, for they could be depended upon to find the way home after the salesmen had entertained well but not wisely.

From three or four lubricants, principally winter lard oil and beef tallow sold at that time, to the multitude of specialized lubricants of today, gives some idea of our industrial progress and the growth of the petroleum industry, Mr. Marble pointed out. It was not until 1891 that the red engine oil of today came into general use, a compound of paraffin oil and lard or sperm oil having been the best engine oil up to that time. Ten years previously, D. A. Stuart, founder of the 74-year old company, first introduced into Chicago yellow cup grease similar to that of today, then imported from Germany.

Harris Joins Faber

NEW YORK, Sept. 29.—Sid G. Harris, formerly sales engineer and later district manager for Macmillan Petroleum Corp., has joined the Faber Laboratories of Chicago, with headquarters at the Faber company's New York office. He is a member of the Society of Automotive Engineers, having been chairman of the Metropolitan section in 1934-1935.

FHA Extends Deadline For Burner Approval

NEW YORK, Sept. 28.—The Federal Housing Administration in accordance with a request of the Oil Burner Institute has extended the effective date of new approval requirements for mechanical draft oil burners, installed in FHA-financed houses, from Oct. 1 to Oct. 31, according to G. Harvey Porter, O.B.I. managing director.

The Institute has arranged a meeting of all manufacturers, both members and non-members, to be held Oct. 12 at the Benjamin Franklin Hotel, Philadelphia. (See N.P.N., Sept. 14, for earlier story.)

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October To See Unveiling Of Most of the '39 Models

By John W. Thompson

N. P. N. Staff Writer

DETROIT, Oct. 1

THOSE who wait almost breathlessly to find out what the new cars will be like will not have long now to remain in suspense. Present schedules of the manufacturers will have practically all the 1939 models in dealers' show rooms and ready for the public gaze by Oct. 22, with the possible exception of Ford, the unknown.

This will pre-climax the New York Auto Show, where the cars are to be "officially introduced" to the American public, by three weeks. It appears that the rush to get new models into the field is not so much brought on by the competitive urge as it is by dealer demands. Most car dealers are now traveling light with 1938 models, and they want the new models as soon as they can get them.

One car manufacturer reported last week that its dealers are now blessed with an average stock of only 1.4 of the 1938 models each. Not since 1934 have dealers been in such a clean position on old stock, according to reports.

"What will the new cars be like?", you ask. The recipe for the composite 1939 car is as follows; take one part 1938 Lincoln Zephyr, one part 1938 Graham, add a steering column gear shift lever—and you have what the 1939 car will look like.

Buick and Studebaker particularly will have a speedboat nose resembling that of the 1938 Zephyr, and there is a trace of the 1938 Graham forward pitch design in the fenders of the new Plymouth.

The manually-operated gear shift lever located under the steering wheel and hinging from the steering column will be almost universally used on the 1939 cars. Buick has dropped its automatic transmission, because of "too many moving parts and more money than people wanted to spend," as one Buick salesman explained it.

Graham and Studebaker have discontinued their vacummatic shift introduced last year, with Graham reverting to the conventional wiggle stick in the floor, and Studebaker following the new trend of steering post shift lever.

Ford isn't expected to show its 1939 offering until close to New York show time on Nov. 11, but reports from various sources seem to point to the elimination of the Big Lincoln, and in its place present a larger Lincoln Zephyr. In addition to its standard Ford line, this company is expected to squeeze a more pretentious Ford into the price class between the standard Ford and the new and deluxe Zephyr, where it would compete with such cars as the Oldsmobile, Pontiac, and Buick.

Then, from the purely rumor route, we hear that a company in Rochester, N. Y. has purchased the old Franklin patents, and will produce a revolutionary rear-engined, three-wheeled car. This job, drooling with streamlining and with two wheels in front and one in the rear, will be powered by an air-cooled engine. Reports set the price at about $500.

Although the general swing to the rear-engined car will probably not make itself felt for another two or three years, predictions here in Detroit are that its coming is inevitable. Ford is known to have obtained two patents on rear-engined design in the past year, and General Motors has one.

The latest Ford rear-engined patent provides for a V-8 engine, with transmission, differential and other mechanical parts assembled over the rear axle, providing a more direct drive from engine to wheels.

In the automobile manufacturing business a constant parade of inventions, all of which will "revolutionize" the industry, are continually flaring up to haunt those who hold the money bags. Some click; some don't.

In England, an Italian engineer, one Commendatore Piero Salerni, recently introduced an invention before an engineering society, which can replace the clutch and gearshift of any standard automobile. Salerni is reported to have said that he will not sell it out to any one company, but will make it available to manufacturers throughout the world.

The substance of this invention is a centrifugal oil pump which provides a jet of oil between engine and transmission, instead of gears. The result is a varying speed of infinite range, simply by pressing the foot on the accelerator. The cost of this device is said to be much less than a gear clutch, and after 65,000 miles of operation it was claimed that no signs of wear were shown.

Herbert Chase, an SAEer, writing in the *New York Times*, points out that hydraulic transmissions have been known and used in various forms for at least 30 years, and that numerous attempts have been made to apply them to automotive vehicles with greatly varying degrees of success.

Chase recognizes the significance of a recent announcement by a division of the Yellow Truck and Coach Manufacturing Co., that a form of hydraulic transmission is now commercially available for use on buses. He sees in this a renewed interest in its possible application to passenger cars, particularly as Yellow Truck is a unit of General Motors.

It invariably adds timeliness and a note of authority to an article of this nature to remark that, even though the 1939 models are only now being unveiled, engineers and designers are already deep into plans for the 1940 and 1941 models.

That brings us to the question of what the automobile of the future will be like. The No. 1 answerer of that question is, as always, William B. Stout, president of Stout Engineering Laboratories, Inc., Dearborn, Mich., and a past president of the SAE. Stout is probably the most quoted neck-sticker-outers in the automotive industry, and what is more, he is not lacking in knowledge or experience.

He claims that present-day automobiles are still something that "just happened". He believes that the future car must be "suddenly different"—and the public will immediately want it. Stout is an exponent of the rear-engine car school. It was he who, a few years ago, developed the Stout Scarab. This was an engine-in-the-rear vehicle, no longer than the conventional car, but with ample interior space to move around in, and furnished with movable chairs for passengers and a comfortable divan.

Stout predicts that future cars will be made in replaceable assemblies, that is, engine, rear axle, front wheel and steering unit, and so on, will be detachable and replaceable as a whole.

He believes that the present weight of an engine, 10 pounds per horsepower, will be reduced in the future to 3½ pounds per horsepower and that cars will be manufactured more cheaply. Future cars will get from 25 to 40 miles per gallon gasoline consumption, Stout believes.

To keep its finger more closely on dealer relationships, and to foster a tighter bond of understanding between factory and dealer, Studebaker has formed a Dealer Advisory Council.

Unlike other factory dealer boards such as General Motors', members of the Studebaker council will not be chosen by the factory, but by out-of-the-hat drawings by disinterested persons. There will be a total of 48 counsellors, three dealers from each of the company's 16 regional territories.

Each counsellor will be paid at the rate of $25 a day for each day he sits on the council, plus all expenses to and from South Bend. Meetings will probably be held every 60 days. The representatives will be concerned primarily with general selling plans and each man will have an equal voice, according to George D. Keller, Studebaker vice president.

7 Veteran Pure Oil Workers Honored

NEWARK, OHIO, Oct. 1.—On retirement from active service seven veteran employes of the Heath refinery of Pure Oil Co. were honored at a dinner here recently by fellow employes and company officials.

Among those retiring, effective Oct. 1, is Charles C. Butterfield, dean of employes, with 46 years continuous service with Pure Oil and its predecessors.

Butterfield, now an oil transfer gauger, started in October, 1892, with the Producers Pipe Line Co., which became part of the old Pure Oil Co. of New Jersey, which in turn became part of the present Pure Oil Co. in 1917. He has been at the Heath refinery for 13 years.

Others retiring are W. B. Anne, John J. Dunaway, G. E. Hogrefe, H. R. Roush, F. P. Cooper, and I. W. Canada.

Charles A. Ward, editor of Pure Oil company publications, presided and presented mementos to the honor guests.

National Petroleum News Ownership Statement

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, and March 3, 1933, of National Petroleum News, published weekly at Cleveland, Ohio, for October 1, 1938, State of Ohio, County of Cuyahoga.

Before me, a notary public in and for the State and County aforesaid, personally appeared A. E. Kraft, who, having been duly sworn according to law, deposes and says that she is the business manager of the National Petroleum News and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The National Petroleum Publishing Company, Cleveland, Ohio.; editor, Warren C. Platt, Cleveland, Ohio; managing editor, V. B. Guthrie, Cleveland, Ohio; and business managers are: A. E. Kraft, Cleveland, Ohio.

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5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

(Signed) A. E. KRAFT,
Business Manager.

Sworn to and subscribed before me this 28th day of September, 1938.

(Signed) H. L. RICHEY,
Notary Public.

(My commission expires May 7, 1939.)

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Oil Supplies Growing Share Of All Energy Used in U. S.

CLEVELAND, Oct. 1.—Domestic petroleum production in 1937 accounted for 31.7 per cent of the total supply of available energy from petroleum, natural gas, coal, and water power, according to the Minerals Yearbook, 1938, recently issued by the U. S. Bureau of Mines.

This energy amounted to 7666 trillion British thermal units (one Btu. will raise the temperature of one pound of water one Fahr. degree) and compares with 25,739 trillion Btu. from all sources, which is roughly enough to raise ice water in a 32-mile-diameter lake 100 feet deep to the boiling point.

While the total heat from petroleum is a record high, that from all sources is not yet back to the level of 1929 (26,534 trillion Btu.), the statistics show. The reduction of coal consumption through the substitution of other fuels and from increased efficiency in energy recovery from coal accounts for the smaller total energy.

Coal contributed 53.7 per cent of the total heat energy, the lowest figure in 50 years (81.8 per cent in 1918). The total energy supply from coal alone, 12,977 trillion Btu., was about the same as in 1911 when this was a record high. Coal production reached a record high 20 years ago which has never been surpassed. Using 1918 as a base, the 1937 domestic petroleum production has more than tripled (3.59 times as great) while coal production was 73 per cent of 1918 volume.

Total energy from natural gas was also at a record high of 2526 trillion Btu. in 1937 which is 10.4 per cent of the total from all sources. These percentages are computed with water power counted at the prevailing average central station equivalent for the year. This figure of 1.42 pounds of coal per kilowatt hour has declined from 7.05 in 1899. It was 1.44 pounds in 1936. Other figures are shown on the basis of a constant value of 4 pounds through the years.

Taxes Bother Pump Men Too, Meeting Shows

NEW YORK, Sept. 30.—Federal and state tax legislation as it affects members of the gasoline pump industry, standardization of some of the important features and specifications of the gasoline pump, and a review of developments in weights and measures regulations, were among the topics discussed at the fifth anniversary meeting of the Gasoline Pump Manufacturers Assn. held at Dearborn Inn, Dearborn, Mich., Sept. 20 and 21.

Another subject discussed was that of institutionalizing the exhibits of the industry products on some regular schedule which would best serve the needs of the market and the jurisdictional bureaus, as well as simplify the problem for the industry.

These business discussions occupied all of the first day and the morning of the second. The afternoon of the second day was occupied with a golf tournament at the Dearborn Country Club. In the evening, there was a banquet at the Dearborn Inn with these speakers: R. Eugene Risser, president, Southwest Pump Co.; B. F. Geyer, president, The Wayne Pump Co.; O. R. Waller, vice-president, Petroleum Marketer; Dr. William S. Sims, humorist and lecturer; Warren C. Platt, editor NATIONAL PETROLEUM NEWS.

WASHINGTON—Internal Revenue Bureau has advised the National Petroleum Assn. that gasoline and lubricating oils sold to Portland (Maine) Water District are exempt from federal taxes.

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Markets

Mid-Continent

TULSA, Oct. 3. — Refined and natural gasoline prices continued downward in the Mid-Continent last week. Oklahoma 62 octane and below gasoline was offered 0.25 cent lower at 3.75 cents, and this grade was available at the same price, on a Group 3 basis, from other districts of the Mid-Continent. The Oklahoma refiner, whose quotations had been establishing the highs of market price ranges for several weeks, reported reducing his quotations for 62 octane and below, and 70-72 octane, 0.25 cent to 4.75 cents and 5.5 cents, respectively. Competition was keen for the small amount of open spot market business available, but shipments against contracts were fairly heavy, refiners said.

Grade 26-70 natural gasoline was quoted generally at 2.75 cents both f.o.b. Breckenridge and f.o.b. Group 3, according to reports. Manufacturers said demand from Gulf Coast refiners was better.

No sales of kerosine in open spot market were reported by sellers. There were unconfirmed reports of price shading on Oklahoma kerosine. Refiners, however, said their quotations were unchanged.

Pennsylvania

NEW YORK, Oct. 3. — Most products were without material change in the western Pennsylvania market the last week of September. Refiners generally said that neutral oils and kerosine were well held at unchanged prices.

Reports from some quarters were that bright stock was being offered more freely. Quotations reported for 25 pour bright stock, however, were unchanged at a minimum of 14 cents.

Although still quoting 4.875 cents for 45 water white kerosine, one refiner in the lower field said that because of recent heavy shipments of this product he was taking care of his regular trade only.

Reports concerning gasoline varied widely. Several sellers said shipments were heavy and prices firm. Another said that shipments were only fair, and easiness was creeping into the price structure in some quarters.

Eastern

NEW YORK, Oct. 3. — Wholesale gasoline prices at eastern seaboard points continued to recede, with consumption of gasoline generally declining throughout the territory.

Easy wholesale markets, so far this year, have gone hand in hand with reduced consumption. Reports of some traders were that due to the lessened consumption, stocks have been piling up at eastern seaboard refineries and terminals. Too, gasoline prices at the Gulf have been lowered coincident with the lowering of wholesale prices here.

Consumption for New York, New Jersey and the New England States shows a combined drop of slightly more than 8 per cent in July gallonage this year as against total gallonage in July last year, according to the American Petroleum Institute's figures. Reports from distributors generally were that consumption in August and September of this year also would show a similar decline under a year ago.

Gulf

NEW YORK, Oct. 3.—The European war scare stimulated interest in the Gulf market the past week, but following the Munich conference interest subsided. The U. S. Gulf and South America probably would have been called upon to provide oil supplies in the event of war, suppliers pointed out.

One supplier reported a nominal advance in his prices for all products. If war was declared the products would be worth more money, he said, while if, as it turned out, war was averted, inquiries which were in the market would be withdrawn.

Actual trading last week was at low ebb. Prices for gasoline and heavy fuel oils continued easy, according to reports of traders.

California

LOS ANGELES, Oct. 1. — West coast bulk petroleum suppliers, who had held up definite commitments pending outcome of the European war-scare, reported an increase in inquiry from off-shore points as the situation eased.

Characterized as feelers were inquiries received for "a cargo or so" of gasoline and for several cargoes of diesel and fuel oil, from Pacific foreign buyers. Atlantic foreign contacts were also reported in the market for an aviation-grade gasoline.

Reports, unconfirmed, had it that several cargoes of aviation motor fuel were sold for an Atlantic foreign destination.

Continued warm weather was an obstacle to the indicated trend of burning oils toward higher prices. Diesel oil at independent plants ranged upward of 2.5 cents a gallon and kerosine-distillate at 2.75 and up.

Rack prices on unbranded gasolines at independent plants in the Los Angeles Basin showed no change from 6.75 cents although some goods was reported moved at slightly less. Retail prices on these products ranged from 13.9 to 11.5 cents, tax included.

Mid-Western

CHICAGO, Oct. 3. — Gasoline was freely available in the Mid-Western market the past week, according to reports of traders generally. Early in the week one tank car marketer reported reducing his quotation for 62 octane and below gasoline 0.125 cent to 3.625 cents a gallon. Unconfirmed reports of increased price shading on all grades of gasoline were heard as the week progressed.

Michigan refiners for the most part said offerings of straight run gasoline were plentiful. One or two said demand for the 70-72 octane grade was fairly active but buyers showed little interest in other grades.

Jobber interest in kerosine continued to lag, according to Chicago tank car marketers, while Michigan refiners reported marked improvement in demand for this product.

Wax

NEW YORK, Oct. 3. — Wax prices generally were unchanged at New York harbor and at the Gulf in the week ended Oct. 1, according to reports of suppliers.

Some indications of higher prices were reported by New York suppliers, but general quotations, up to the close of business Oct. 1, ranged upward from 2.35 cents for white scale grade.

Wax demand, both domestic and export, has been fair to good, sellers said.

Fuel Oil

CHICAGO, Oct. 3. — All grades of light burner fuels generally were reported firm in the Mid-Western market the last week of September. No. 3 fuel in particular showed marked evidence of tightness. Interest centered on shipments against contract, tank car marketers said. Current weather conditions were not conducive to interest in the open spot market.

All grades of Michigan light fuel were closely held and became increasingly hard to obtain, according to reports. Quotations generally were reported unchanged.

Industrial fuel movement in the Chicago area continued to lag, most marketers said. Michigan heavy fuels, on the contrary, continued in good demand and one refiner reported advancing his quotations on 500-700 and 300-500 vis. fuels 0.25 cent to 2.75 and 3 cents, respectively.

* * *

NEW YORK, Oct. 3. — Fuel oils were without especial feature in whole-

(*Continued on page* 44)

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

Prices Effective	Oct. 3	Sept. 26
F.O.B. GROUP 3		
Grade 26-70	2.75	3.00
F.O.B. BRECKENRIDGE		
Grade 26-70	2.75	2.75 – 3.00
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.50 – 6.75	6.50 – 7.75

Kerosine

WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.125– 5.375	5.125– 5.375
46 w.w.	(e) 5.25 –5.375	(e) 5.25 –5.375
Other districts:		
45 w.w.	4.875– 5.00	4.875– 5.00
46 w.w.	(h) 5.125–5.25	(h) 5.125–5.25
47 w.w.	5.125– 5.375	5.125– 5.375
CENTRAL MICHIGAN (a)		
47-49 w.w.	5.05 – 5.30	5.05 – 5.30
OKLAHOMA		
41-43 w.w.	4.00 – 4.25	4.00 – 4.25
42-44 w.w.	4.25 – 4.625	4.25 – 4.625
KANSAS (For Kansas destinations only).		
41-43 w.w.	(e)4.375	(e)4.375
42-44 w.w.	4.625– 4.75	4.625– 4.75
N. TEX. (b)		
41-43 w.w.	4.25 – 4.50	4.25 – 4.50
N. LA. (For shipment to La. and Ark.)		
41-43 w.w.	4.00 – 4.50	4.00 – 4.50
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
41-43 w.w.	4.50	4.50
CALIFORNIA		
40-43 w.w.	5.00 – 7.00	5.00 – 7.00

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	4.375– 4.50	4.375– 4.50
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.00 – 4.25	4.00 – 4.25
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.75 – 5.00	4.75 – 5.00
No. 3 gas oil, Str.	4.25 – 4.625	4.25 – 4.75
U.G.I. gas oil	4.00 – 4.375	4.00 – 4.375
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.375– 2.75	2.375– 2.50
300-500 Vis.	2.50 – 3.00	2.50 – 2.75
100-300 Vis.	2.625– 3.25	2.625– 3.25
OKLAHOMA		
No. 1 prime white	3.75 – 4.00	3.75 – 4.00
No. 1 straw	3.625– 3.875	.....
No. 2 straw	3.50 – 3.75	3.50 – 3.75
No. 2 dark	(e)3.625	.....
U. G. I. gas oil	(f)	(f)
28-30 fuel oil	(e)3.25	(e)3.25
28-30 zero fuel	3.25 – 3.50	3.25 – 3.50
24-26 fuel	(e)$0.925	(e)$0.925
18-22 fuel	(f)	(f)
14-16 fuel	(e)$0.70	(e)$0.70
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.00 – 4.125	4.00 – 4.125
10-14 fuel oil	$0.45 –$0.80	$0.45 –$0.80
N. TEX. (b)		
No. 1 Prime white	(e)4.00	(e)4.00
N. LA. (For shipment to La. and Ark.)		
20-24 fuel	(e) $1.00–$1.05	(e) $1.05–$1.10
16-20 fuel	(e) $0.80–$0.85	(e) $0.85–$0.90
10-14 fuel	(e) $0.70–$0.75	(e) $0.75–$0.80
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
No. 2 fuel	3.625	3.625
28-30 gas oil, zero	3.375	3.375
Ark. Tractor Fuel	(i)4.625	.....

Prices Effective	Oct. 3	Sept. 26
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.70 –$0.85	$0.70 –$0.85
Diesel fuel (per gal.)	3.00 – 4.00	3.00 – 4.00
Stove dist. (per gal.)	3.75 – 6.00	3.75 – 6.00
Los Angeles:		
Heavy fuel	$0.50 –$0.90	$0.45 –$0.90
Light fuel	$0.60 –$1.00	$0.60 –$1.00
Diesel fuel (per gal.)	2.50 – 4.00	2.675– 4.00
Stove dist. (per gal.)	2.75 – 6.00	2.875– 6.00
San Francisco:		
Heavy fuel	$0.95	$0.95
Light fuel	$1.05	$1.05
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	6.50	6.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)

Viscous Neutrals No. 3 col. (Viscosity at 70° F.)		
200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	19.00 –19.50	19.00 –19.50
10 p.t.	18.00 –18.50	18.00 –18.50
15 p.t.	17.50 –18.00	17.50 –18.00
25 p.t.	16.00	16.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	17.00 –18.50	17.00 –18.50
10 p.t.	16.00 –17.00	16.00 –17.00
15 p.t.	15.00 –16.00	15.00 –16.00
25 p.t.	14.00 –15.00	14.00 –15.00

SOUTH TEXAS

Vis. Color		
Pale Oils: (*Vis. at 100°F.*)		
100 No 1½-2½	5.00 – 5.25	4.75 – 5.25
200 No. 2-3	6.25	6.25
300 No. 2-3	6.75	6.75
500 No. 2½-3½	7.75	7.75
750 No. 3-4	8.25	8.25
1200 No. 3-4	8.75	8.75
2000 No. 4	9.00 – 9.25	9.00 – 9.25
Red Oils:		
200 No 5-6	6.25	6.25
300 No. 5-6	6.75	6.75
500 No. 5-6	7.75	7.75
750 No. 5-6	8.25	8.25
1200 No. 5-6	8.75	8.75
2000 No. 5-6	9.00 – 9.25	9.00 – 9.25

Note: Red oil prices cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

Pale Oils: (0 to 10 P.P.)		
Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	9.50 –10.00	10.00
200—No. 3	10.00 –10.50	10.50
250—No. 3	11.00 –11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	(e)9.00	(e)9.00
200—No. 5	9.00 –10.00	9.50 –10.00
280—No. 5	11.50 –11.75	11.50 –11.75
300—No. 5	(e)12.00	(e)11.75

Note: The following oils, of 15 to 25 p.p., are generally quoted these amounts under 0-10 p.p.; viscous oils, 0.5c; non-viscous, 0.25c. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils 0 to 10 p.p.:		
Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50

Prices Effective	Oct. 3	Sept. 26
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis)

Bright Stocks:		
190-200 Vis. at 210 °D.	(e)19.00	(e)19.00
150-160 Vis. at 210°D:		
0 to 10 p.p.	14.25 –16.00	14.25 –16.00
10 to 25 p.p.	13.50 –15.50	13.50 –15.50
25 to 40 p.p.	13.50 –15.00	13.50 –15.00
150-160 vis. at 210° E.	12.50 –15.00	12.50 –15.00
120 Vis. at 210° D		
0 to 10 p.p.	14.50 –15.125	14.50 –15.125
25 to 40 p.p.	(e)14.25	(e)14.25
600 S.R Dark Green	5.00 –7.50	5.00 –7.50
600 S.R. Olive Green	6.50 – 7.50	6.50 – 7.50
631 S.R.	(e)12.50	(e)12.50
Black Oil	3.50 – 4.00	3.50 – 4.00

CHICAGO (Viscosity at 210°)

Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	15.75	15.75
15 to 25 p.p.	14.75	14.75
30 to 40 p.p.	14.25	14.25
E filtered Cyl. Stock	13.50	13.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)

600 S.R. filterable	8.00 – 8.50	8.00 – 8.50
650 S.R.	10.00 –11.50	10.00 –11.50
600 fl.	10.50 –12.50	10.50 –12.50
630 fl.	13.00 –14.00	13.00 –14.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	17.00 –17.50	17.00 –17.50
15 p.t.	16.00 –16.50	16.00 –16.50
25 p.t.	14.00 –14.50	14.00 –14.50

Petrolatums

WESTERN PENNA. (In bbls., carloads; in tank cars, 0.5c less)		
Snow White	6.125	6.125
Lily White	5.125	5.125
Cream White	4.125	4.125
Light Amber	2.50 – 2.625	2.50 – 2.625
Amber	2.25 – 2.375	2.25 – 2.375
Red	2.00	2.00

Wax

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only. In bbls., carloads, New York)		
122-124 A.m.p., w.c. scale	(h)2.40	(h)2.40
124-126 A.m.p., w.c. scale	2.40	2.40
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126 A.m.p., w.c. scale	2.35	2.35
CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124	4.00	4.00
125-127	(i)4.10	(i)4.10
127-129	(i)4.45	(i)4.45
130-132	(i)4.75	(i)4.75
132-134	(i)5.00	(i)5.00
135-137	(i)5.75	(i)5.75

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) One refiner quoting. (f) No price reported. (g) To resellers holding licenses. (h) Two refiners quoting. (i) Same prices quoted in bags or slabs loose.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline

Prices Effective	Oct. 3	Sept. 26
OKLAHOMA		
U. S. Motor: (Octane L-3)		
62 oct. & below	3.75 – 4.875	4.00 – 5.00
63-66 oct.	4.25 – 5.125	4.375– 5.125
67-69 oct.	4.375– 5.375	4.50 – 5.375
70-72 oct.	4.625– 5.625	4.625– 5.75
60-62, 400 e.p.	(e)4.25	4.25 – 4.50
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U. S. Motor (58-62°)	5.25	5.25
Min. 65 oct.	6.75 – 7.25	6.75 – 7.25
Min. 70 oct.	(e)7.50	(e)7.50
"Q" gasoline	(e&g)7.25	(e&g)7.25
Other districts:		
Motor gasoline:		
U. S. Motor (58-62°)	5.00	5.00
Min. 65 oct.	6.50 – 6.75	6.50 – 6.75
"Q" gasoline	(g) 7.00 –7.25	(g) 7.00 –7.25

Prices Effective	Oct. 3	Sept. 26
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c) 4.75 –5.25	(c) 4.75 –5.25
U. S. Motor: (Octane L-3)		
67-69 octane	(e)7.50	(e)7.50
70-72 octane	8.00 – 8.125	8.00 – 8.125
CALIFORNIA (3c tax to be added if used in state)		
U. S. Motor:		
54-58, for instate shipment	6.75 – 9.25	6.75 – 9.25
54-58, for outside state shipment	6.75 – 9.00	6.75 – 9.00
58-61, 375-400 e.p., 65 oct. & above	7.75 – 9.75	7.75 – 9.75
N. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.25 – 4.75	4.50 – 4.75
63-66 oct.	4.50 – 5.25	4.75 – 5.25
67-69 oct.	4.75 – 5.375	5.00 – 5.375
70-72 oct.	5.125– 5.50	5.375– 5.625
60-62, 400 e.p.	4.25 – 4.50	4.50
KANSAS (For Kansas destinations only)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.25 – 4.75	4.375
70-72 oct.	5.125– 5.50	5.25 – 5.50

Prices Effective	Oct. 3	Sept. 26
W. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.375– 4.75	4.375– 4.75
63-66 oct.	4.625– 5.125	4.625– 5.125
67-69 oct.	5.00 – 5.25	5.00 – 5.375
70-72 oct.	5.25 – 5.75	5.25 – 5.75
E. TEX.		
60 62, 400 e.p.	4.50	4.50
N. LA. (For shipment to La. & Ark.)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.375– 4.75	4.50 – 4.75
63-66 oct.	(e)4.625	(e)4.875
67-69 oct.	(e)4.875	(e)5.00
70-72 oct.	5.50	5.50
ARKANSAS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Octane L-3)		
62 octane & below	4.50	4.50
67-69 oct.	5.125	5.125
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	7.375	7.625
Above 65 oct.	7.625	7.875

(Continued on next page)

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) One refiner quoting. (f) No price reported. (g) To resellers holding licenses. (h) Two refiners quoting.

MID-WESTERN TANK CAR MARKET

Prices in this Midwestern Tank Car Market table are gathered from refiners and tank car marketers or brokers from their offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight rate basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Generally when prices are quoted in this Chicago market, the origin of the material is not known at the time the quotation is given, oftentimes even with the quoting refiners who have refineries in more than one refining district. All other gasoline prices are given by and for the particular refining district where the material is made and from which it is shipped.

Gasoline

Prices Effective	Oct. 3	Sept. 26
U. S. Motor: (Octane L-3)		
62 oct. and below	3.625– 4.375	3.75 – 4.375
63-66 oct.	4.125– 4.875	4.125– 4.875
67-69 oct.	4.25 – 5.00	4.25 – 5.00
70-72 oct.	4.375– 5.125	4.50 – 5.25

Kerosine

41-43 w.w.	3.625– 4.25	3.625– 4.25
42-44 w.w.	3.625– 4.375	3.625– 4.375

(a) Nominal.

Fuel and Gas Oils

Prices Effective	Oct. 3	Sept. 26
No. 1 p.w.	3.625– 3.875	3.625– 3.875
No. 1 straw	3.50 – 3.75	3.50 – 3.75
No. 2 straw	3.375– 3.625	3.375– 3.625
No. 3	3.25 – 3.50	3.25 – 3.50
No. 5	(a) $0.60-$0.70	(a) $0.60-$0.70

Prices Effective	Oct. 3	Sept. 26
No. 6	(a) $0.35–$0.50	(a) $0.35–$0.50
U. G. I. gas oil	(a) 2.875–3.125	(a) 2.875–3.125
Range oil	3.625– 4.00	3.625– 4.00

Naphtha and Solvent

Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Sept. 30, 1938)

U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):	Sept. 26	Sept. 27	Sept. 28	Sept. 29	Sept. 30
62 octane and below:					
Oklahoma	4.00 – 5.00	3.875– 4.875	3.875– 4.875	3.75 – 4.875	3.75 – 4.875
(b) North Texas	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
West Texas	4.375– 4.75	4.375– 4.75	4.375– 4.75	4.375– 4.75	4.375– 4.75
Mid-Western (Group 3 basis)	3.75 – 4.375	3.75 – 4.375	3.75 – 4.375	3.625– 4.375	3.625– 4.375
63-66 octane:					
Oklahoma	4.375– 5.125	4.375– 5.125	4.375– 5.125	4.375– 5.125	4.375– 5.125
(b)North Texas	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
West Texas	4.625– 5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125
Mid-Western (Group 3 basis)	4.125– 4.875	4.25 – 4.875	4.25 – 4.875	4.25 – 4.875	4.25 – 4.875
67-69 octane:					
Oklahoma	4.50 – 5.375	4.50 – 5.375	4.50 – 5.375	4.50 – 5.375	4.50 – 5.375
(b)North Texas	5.00 – 5.375	5.00 – 5.375	5.00 – 5.375	5.00 – 5.375	5.00 – 5.375
West Texas	5.00 – 5.375	5.00 – 5.375	5.00 – 5.375	5.00 – 5.375	5.00 – 5.375
Mid-Western (Group 3 basis)	4.25 – 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00
70-72 octane:					
Oklahoma	4.625– 5.75	4.625– 5.625	4.625– 5.625	4.625– 5.625	4.625– 5.625
(b)North Texas	5.375– 5.625	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50
West Texas	5.25 – 5.75	5.25 – 5.75	5.25 – 5.75	5.25 – 5.75	5.25 – 5.75
Mid-Western (Group 3 basis)	4.50 – 5.25	4.50 – 5.25	4.50 – 5.125	4.50 – 5.125	4.50 – 5.125
Motor Gasoline, 60-64 octane:					
New York harbor	(a) 6.25– 6.75	(a) 6.00– 6.75	(a) 6.00– 6.75	(a) 6.00– 6.75	(a) 6.00– 6.75
Philadelphia district	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50
Baltimore district	(a) 6.25– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50
Motor Gasoline, 65 octane & above:					
New York harbor	(a) 6.25– 6.75	(a) 6.00– 6.75	(a) 6.00– 6.75	(a) 6.00– 6.75	(a) 6.00– 6.75
Philadelphia district	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00– 6.50	(a) 6.00 –6.50
Baltimore district	(a) 6.50– 6.75	(a) 6.25– 6.75	(a) 6.25– 6.75	(a) 6.25– 6.75	(a) 6.25– 6.75
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	5.25	5.25	5.25	5.25	5.25
Other districts (Western Penna.)	5.00	5.00	5.00	5.00	5.00
Motor Gasoline, Min. 65 octane:					
Bradford-Warren (Western Penna.)	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25
Other districts (Western Penna.)	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75
Motor Gasoline, Min. 70 octane:					
Bradford-Warren (Western Penna.)	(c)7.50	(c)7.50	(c)7.50	(c)7.50	(c)7.50
"Q" Gasoline:					
Bradford-Warren (Western Penna.)	(c&d)7.25	(c&d)7.25	(c&d)7.25	(c&d)7.25	(c&d)7.25
Other Districts (Western Penna.)	(d) 7.00– 7.25	(d) 7.00– 7.25	(d) 7.00– 7.25	(d) 7.00– 7.25	(d) 7.00 –7.25

(a) Nominal. (b) For shipment to Texas and New Mexico destinations: Group 3 prices are quoted on northern shipment. (c) One refiner quoting. (d) To resellers holding licenses.

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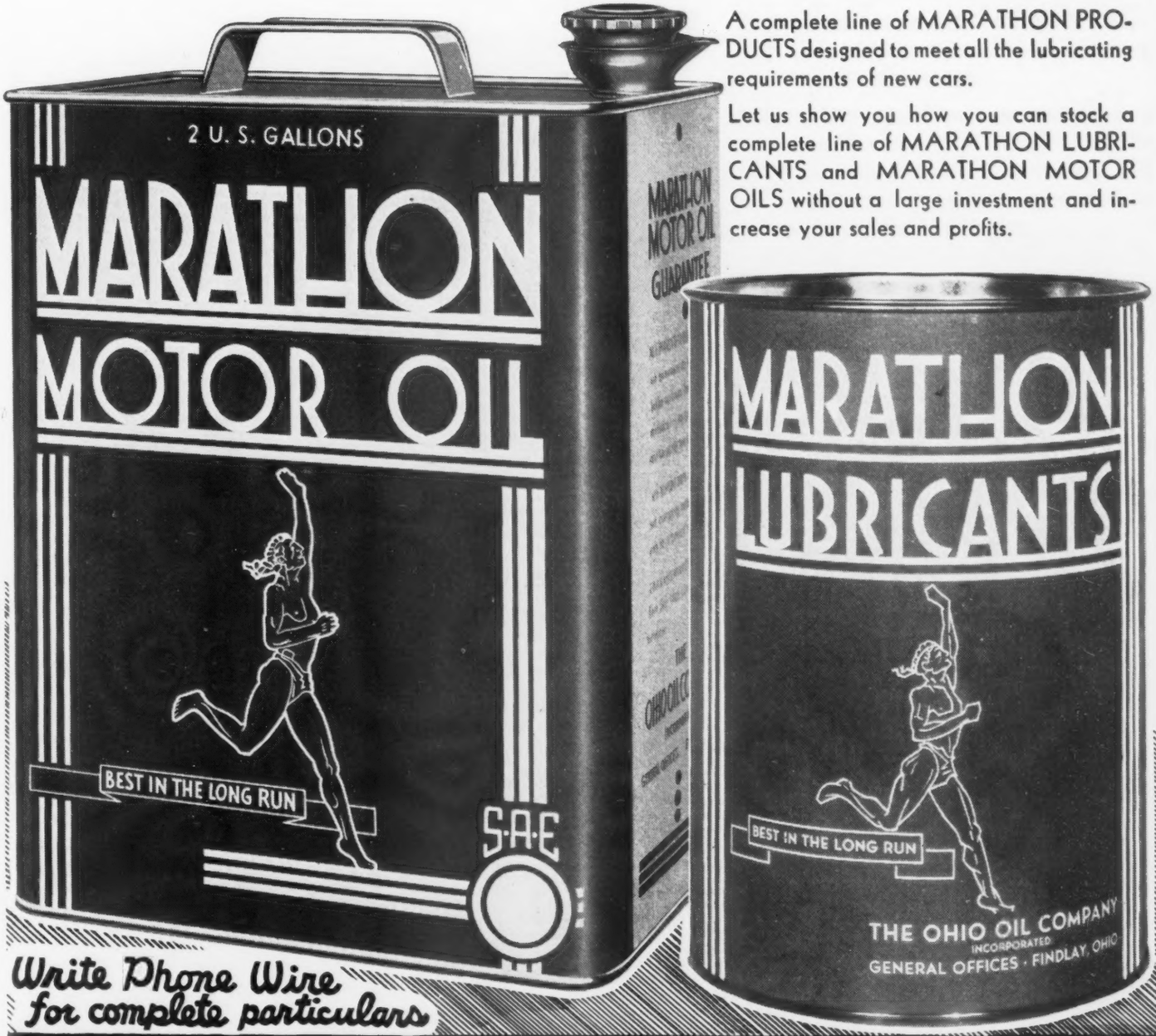

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THE OHIO OIL COMPANY

GENERAL OFFICES - - - FINDLAY, OHIO

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include* 1c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Oct.* **3, 1938,** *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Essolene
(Regular Grade)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	6.9	8.9	4	8
*Newark, N. J.	6.9	8.9	4	8
Annapolis, Md.	7.85	9.35	5	9.5
Baltimore, Md.	7.25	8.75	5	9
Cumberland, Md.	8.65	11.15	5	10
Washington, D. C.	7.5	9	3	9.5
Danville, Va.	8.45	10.95	6	12.9
Norfolk, Va.	7.25	9.75	6	11.5
Petersburg, Va.	7.55	10.05	6	11.7
Richmond, Va.	7.55	10.05	6	11.7
Roanoke, Va.	8.75	11.25	6	12.9
Charleston, W. Va.	8.05	10.55	6	12.6
Parkersburg, W. Va.	7.35	9.35	6	11.2
Wheeling, W. Va.	8.35	10.25	6	12.2
Charlotte, N. C.	8.65	11.15	7	12.1
Hickory, N. C.	9.15	11.65	7	12.5
Mt. Airy, N. C.	8.95	11.45	7	12.3
Raleigh, N. C.	8.25	10.75	7	11.6
Salisbury, N. C.	8.75	11.25	7	12.2
Charleston, S. C.	7.25	9.75	7	10.6
Columbia, S. C.	8.25	10.75	7	11.6
Spartanburg, S. C.	8.95	11.45	7	12.4

Discount to undivided dealers, except in New Jersey, which see in "Note" below: Dealer t.w. price less 0.5c per gal.

*Effective Sept. 26, 1938, S. O. New Jersey posted a minimum retail resale price of 11.4c thru New Jersey, except Trenton area and Cumberland county.

Note: While the above posted prices continue at Atlantic City and Newark, N. J., dealers will pay a net price of 8.4c per gal. for Essolene. Dealers having pumps marked only Esso, Essolene and "Standard" White gasoline will pay 7.9c per gal. for Essolene.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount. 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)
Socony Mobilgas
(Regular Grade)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.25	8.9	*5	‖
Borough of Richmond (Staten Is.)	7.25	8.9	*5	8
Albany, N. Y.	7.3	9.3	5	8.5
Binghamton, N. Y.	8.5	10	5	9
Buffalo, N. Y.	8.1	9.1	5	8
Jamestown, N. Y.	7.8	9.8	5	8.25
Plattsburg, N. Y.	7.8	9.8	5	9.5
Rochester, N. Y.	8.2	10	5	8.5
Syracuse, N. Y.	7.9	9.5	5	9
Danbury, Conn.	7.6	9.6	4	9
Hartford, Conn.	7.4	9	4	7
New Haven, Conn.	7.3	9.3	4	6
Bangor, Me.	7.75	9.5	5	9
Portland, Me.	7.25	9	5	8.75
Boston, Mass.	7	8.5	4	‖
Concord, N. H.	8.1	9.7	5	9
Lancaster, N. H.	9	11.2	5	10.25
Manchester, N. H.	7.8	9.5	5	8.5
Providence, R. I.	7	8.5	4	7.5
Burlington, Vt.	7.65	9.7	5	9.5
Rutland, Vt.	‖	10	5	9

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

Atlantic White Flash Gasoline
(Regular Grade)

	Commercial Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	6.5	7	5	10
Pittsburgh	8	10	5	10.5
Allentown	7.5	9	5	10.5
Erie	8	9.5	5	10
Scranton	7.5	9	5	10.5
Altoona	8	10	5	10.5
Harrisburg	7.5	9	5	10.5
Williamsport	7.5	9	5	10.5
Dover, Del.	...	7.5	5	10.5
Wilmington	...	8.5	5	9.75
Boston, Mass.	...	8.5	4	8
Springfield, Mass.	...	9	4	8
Worcester, Mass.	...	9	4	8
Fall River, Mass.	...	8.5	4	8
Hartford, Conn.	...	9	4	7
New Haven, Conn.	...	9.3	4	7
Providence, R. I.	...	8.5	4	8
Atlantic City, N. J.	...	8.4	4	8
Camden, N. J.	...	7.7	4	8
Trenton, N. J.	...	8.2	4	8
Annapolis, Md.	...	9.85	5	9.5
Baltimore, Md.	...	9.25	5	9
Hagerstown, Md.	...	10.35	5	10
Richmond, Va.	...	10.05	6	11.7
Wilmington, N. C.	...	10.35	7	10.8
Brunswick, Ga.	...	8	7	*11.5
Jacksonville, Fla.	...	7	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Price basis to commercial consumers: consumers under contract, in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w. delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

Sohio X-70 Gasoline
(Regular Grade)

	Consumer T.W.	†Divided Dlr.	Gasoline Taxes	Kerosine T.W.
Ohio Statewide	11	10	5	*12
Counties where some prices are below statewide:				
Butler, Clark, Clinton, Columbiana, Defiance, Greene, Pickaway, Preble and Warren:	10.5	9.5	5	....
Fairfield, Franklin, Montgomery and Paulding:	10	9	5	....
Hamilton	11	9	5	....
Knox	10.5	9	5	....

Renown Gasoline
(Third Grade)

Ohio Statewide	10.5	9.5	5	....
Counties where some prices are off statewide:				
Clark, Columbiana, Defiance, Montgomery and Pickaway	10	9	5	....
Clermont, Darke, and Miami:	11	9.5	5	....
Fairfield, Franklin and Paulding:	9.5	8.5	5	....
Hamilton	11	9	5	....
Knox	10	8.5	5	....

S. O. Ohio Cont'd

Kerosine Prices

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull and Van Wert	*11.5
Paulding	*11
Ashtabula	*10.5
Fayette, Madison, Pickaway, Portage and Summit	*8.5

†This price also to authorized agents, exclusive of 0.5c rental. Discount to undivided dealers: 0.5c less than divided dealer t.w.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

Commercial Tank Wagon O.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 33 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 0.5c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 30 counties where Q.D.A. differs from statewide are: Allen, Ashtabula, Auglaize, Butler, Champaign, Columbiana, Cuyahoga, Darke, Defiance, Erie, Fulton, Geauga, Hamilton, Hancock, Hardin, Henry, Highland, Logan, Lorain, Lucas, Mahoning, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Trumbull, Van Wert, Washington, Williams and Wood.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices," S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on statewide level.

S. O. Kentucky

Crown Gasoline
(Regular Grade)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12	9	6	10.5
Lexington, Ky.	13.5	10.5	6	10.5
Louisville, Ky.	12	9	6	10
Paducah, Ky.	12	9	6	10
Jackson, Miss.	12.5	9.5	7	*9.5
Vicksburg, Miss.	13	10	7	*9
Birmingham, Ala.	13.5	10.5	*8	10
Mobile, Ala.	12.5	9.5	*9	9
Montgomery, Ala.	12.5	10.5	*9	*9
Atlanta, Ga.	12	9	7	*9
Augusta, Ga.	12.5	9.5	7	*7
Macon, Ga.	12.5	9.5	7	*10.5
Savannah, Ga.	11	8	7	*9
Jacksonville, Fla.	10	7	8	8
Miami, Fla.	12.5	9.5	8	9
Pensacola, Fla.	12	9	*9	10
Tampa, Fla.	10	7	8	8.5

Kyso Gasoline
(Third Grade)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	12	9.5	6	....
Louisville, Ky.	10	7.5	6	....
Paducah, Ky.	10.5	8	6	....
Jackson, Miss.	10.5	8	7	....
Vicksburg, Miss.	11.5	9	7	....
Birmingham, Ala.	11.5	9	*8	....
Mobile, Ala.	10.5	8	*9	....
Montgomery, Ala.	11.5	9	*9	....
Atlanta, Ga.	8.5	6	7	....
Augusta, Ga.	11	8.5	7	....
Macon, Ga.	11	8.5	7	....
Savannah, Ga.	9.5	7	7	....
Jacksonville, Fla.	9.5	7	8	....
Pensacola, Fla.	10.5	8	*9	....
Tampa, Fla.	9.5	7	8	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month

**Taxes:* In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50 in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 3/100c on gasoline, 1/25c on kerosine.

Kerosine inspection fee only: Iowa, 3/50c: Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Oct. 3, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	11.6	9.6	6.4	4	10.5
Decatur, Ill.	11.6	10.1	8	4	10.5
Joliet, Ill.	11.6	10.1	8.4	4	10.5
Peoria, Ill.	11.6	10.1	9.6	4	10.5
Quincy, Ill.	11.4	8.9	8	4	10.3
Indianapolis, Ind.	12.3	10 8	8.9	5	*10
Evansville, Ind.	12.1	10.6	9.1	5	*11
South Bend, Ind.	12.6	11.1	9.2	5	*9
Detroit, Mich.	10.3	8 8	7.5	4	9
Grand Rapids, Mich.	10.8	9.5	8	4	9.7
Saginaw, Mich.	12.3	10.8	9.3	4	9.3
Green Bay, Wis.	12.4	10.9	10.2	5	10.3
Milwaukee, Wis.	11.8	10.3	9.5	5	10.7
La Crosse, Wis.	12	10.5	10	5	10.9
Minneapolis-St. Paul	12	10.5	10	5	10.9
Duluth, Minn.	12.4	10.9	10.4	5	11.3
Mankato, Minn.	12	10.5	10	5	10.9
Des Moines, Ia.	11.4	9.9	7.5	4	*10.3
Davenport, Ia.	11.6	10.1	9.6	4	*10.5
Mason City, Ia.	11.8	10.3	9.8	4	*10.7
St. Louis, Mo.	11.2	9.7	7.5	*4	10.1
Kansas City, Mo.	10.9	9.4	6.9	*4	7.5
St. Joseph, Mo.	10.9	9.4	8.9	*4	9.8
Fargo, N. D.	13.2	11.7	11.2	4	12.1
Minot, N. D.	14.5	13	12.5	4	13.4
Huron, S. D.	12.5	11	10.5	5	11.4
Wichita, Kans.	10.4	6.6	5.5	4	7.8

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha, Neb.	12	10.5	6	10.8
McCook	11.5	10.5	6	10
Norfolk	12.4	8.9	6	11.2
North Platte	12.4	9.4	6	11
Scottsbluff	13.5	7.9	6	12.3

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Little Rock, Ark.	7.25	9.75	7.5	11
Alexandria, La.	6.75	9.25	8	*11.5
Baton Rouge, La.	6.75	9.25	8	* 9.5
New Orleans, La.	6.75	9.25	*10	*11.5
Lake Charles, La.	6.75	9.25	8	*11.5
Shreveport, La.	5.5	8	8	*10
Lafayette, La.	7	9.5	8	*11.5
Bristol, Tenn.	10.25	11	8	14.5
Chattanooga, Tenn.	9.5	12	8	14
Knoxville, Tenn.	10	12.5	8	14.5
Memphis, Tenn.	8	10.5	8	12.5
Nashville, Tenn.	9	11.5	8	12

*Taxes: New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

Humble Motor Fuel
(*Regular Grade*)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Dallas, Tex.	9	13	5	8
Ft. Worth, Tex.	9	13	5	8
Houston, Tex.	9.5	13.5	5	8
San Antonio, Tex.	9	13	5	8

U. S. Motor Gasoline
(*Third Grade*)

	*T.W.	S.S.	Gasoline Taxes
Dallas, Tex.	6	10	5
Ft. Worth, Tex.	7	10	5
Houston, Tex.	7	11.5	5
San Antonio, Tex.	7.5	10.5	5

*Price is t.w. price to all classes of dealers and consumers.

Continental Oil

Conoco Bronze (*Regular Grade*)
Demand (*Third Grade*)

	Dealer Prices— Conoco Bronz-z-z	De-mand	Gasoline Taxes	Kerosine T.W.
Denver, Colo.	10.5	9.5	5	11.5
Grand Junc., Colo.	14	13	5	15
Pueblo, Colo.	11.5	10.5	5	10.5
Casper, Wyo.	12	11	5	11.5
Cheyenne, Wyo.	8	7	5	13
Billings, Mont.	13	10	6	13
Butte, Mont.	13.5	10.5	6	15.5
Great Falls, Mont.	13	11	6	15.5
Helena, Mont.	14	13	6	15.5
Salt Lake City, Utah	12	10	5	16
Boise, Ida.	13	10.5	6	18
Twin Falls, Ida.	15	12.5	6	18
Albuquerque, N. M.	11	10	†6.5	12
Roswell, N. M.	11	8.5	†6.5	10.5
Santa Fe, N. M.	12	9.5	*7	12
Muskogee, Okla.	9.5	7	5	7
Oklahoma City, Okla.	8.5	6.5	5	7
Tulsa, Okla.	7	5	5	6
Ft. Smith, Ark.	9.25	6.25	5	7.5
Little Rock, Ark.	9.25	7.625	7.5	8
Texarkana, Ark.	9	7	5	8

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

Standard Gasoline
(*Regular Grade*)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	15.5	16.5	6	*12.5
Reno, Nev.	15.5	16.5	5	13.5
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	13.5
Spokane, Wash.	17	18	6	16.5
Tacoma, Wash.	14	15	6	13.5

Flight Gasoline
(*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	14	15	5	....
Phoenix, Ariz.	14	15	6	....
Portland, Ore.	12.5	13.5	6	....
Seattle, Wash.	12.5	13.5	6	....
Spokane, Wash.	15.5	16.5	6	....
Tacoma, Wash.	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over, Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price. Discounts on kerosine: in tank cars, 3c off tank truck price; plant deliveries to jobbers, 2.5c below tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.
Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline
(*Regular Grade*)

	T.W	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont.	16	6	17
Toronto, Ont.	16	6	17
Brandon, Man.	21.1	7	22.3
Winnipeg, Man.	20.5	7	20.7
Regina, Sask.	19	7	21
Saskatoon, Sask.	21.3	7	23.3
Edmonton, Alta.	19.5	7	21.5
Calgary, Alta.	16.5	7	18.5
Vancouver, B. C.	16	7	23
Montreal, Que.	15	6	15
St. John, N. B.	14.5	10	18.5
Halifax, N. S.	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio
Esso Aviation

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline
73 Octane Number

Chicago, Ill.	14 9	4
Detroit, Mich.	16 5	4
Milwaukee, Wis.	15 1	5
Minneapolis, Minn.	15 3	5
St. Louis, Mo.	14 5	3
Kansas City, Mo.	14 2	*4
Fargo, N. D.	16 5	4
Huron, S. D.	15 8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.
Aviation Gasoline

	Tank Car
Baytown, Tex.	8 5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	Dealer	Gasoline Taxes
Denver, Colo.	14 5	5
Cheyenne, Wyo.	15	5
Helena, Mont.	17	6
Salt Lake City, Utah	17.5	5
Albuquerque, N. M.	14	*6 5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz.	17.5	6
Los Angeles, Cal.	15	4
San Francisco, Cal.	15 5	4
Reno, Nev.	17.5	5
Portland, Ore.	16	6
Seattle, Wash.	16	6
Spokane, Wash.	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M.&P.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	11	12 5
*New York City	9 5	10 5
Rochester, N. Y.	12	12 5
Syracuse, N. Y.	12 5	15
Boston, Mass.	11 5	11 5
Bridgeport, Conn.	11	11 5
Hartford, Conn.	11	11 5
Providence, R. I.	11 5	12 5

*Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Oct. 3, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill.	16.2	16.5	15.9
Detroit, Mich.	19.2	18.2	19.7
Kansas City, Mo.	13.9	14.9	14.4
St. Louis, Mo.	14.2	15.2	12.9
Milwaukee, Wis.	18.8	19.8	19.3
Minneapolis, Minn.	19	20	17.7

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10.5	9.5
Providence	10.5	9.5
Ohio points, delivered	8.875	*8

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special. Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P

Latest Changes

From Sept. 27 to Oct. 3 inclusive. Dates and amounts of changes shown. See table for full current prices.

S. O. New Jersey—Essolene:
Consumer t. c. and dealer t. w. cut 0.5c, thru District of Columbia, Maryland, West Virginia, North and South Carolina, Sept. 30. New Jersey and Virginia were unchanged. Exceptions were dealer t. w. at Parkersburg and Wheeling, W. Va., unchanged, and eastern shore of Maryland, unchanged.

Socony-Vacuum Oil Co.—Kerosine:
New Haven cut 1c, Sept. 29.

Atlantic Refining—Atlantic White Flash Gasoline:
Camden dealer t. w. cut 0.7c, Sept. 28.

S. O. Ohio—X-70 and Renown:
Consumer t. w. and dealer prices cut 0.5c, Montgomery County, Sept. 29.

S. O. Indiana—Kerosine:
Kansas City cut 1c, Sept. 28.

Continental Oil—Conoco Bronz-z-z:
Ft. Smith and Little Rock cut 0.5c, Oct. 1.
Boise dealer cut 2.5c, Sept. 29.

Demand:
Boise dealer cut 1c, Sept. 29.

Kerosine:
Tulsa cut 1c, Sept. 27.

S. O. Nebraska—Red Crown Gasoline:
Scottsbluff dealer price cut 4.1c, Sept. 27.

S. O. Louisiana—Essolene:
Consumer t. c. and dealer t. w. cut 0.5c, thru territory, except Bristol t. c. cut 0.25c, and dealer unchanged, Sept. 30.

Imperial Oil—Kerosine:
Montreal cut 1.5c, Sept. 30.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

Atlantic Refining—Atlantic White Flash Gasoline:
Dealer t. w. cut 0.5c, thru New Jersey, except Trenton cut 0.2c, Sept. 26. Brunswick dealer t. w. cut 2c, Sept. 23.

S. O. Indiana—Kerosine:
Indianapolis cut 1.2c, to 10c t. w. Aug. 26, instead of 0.4c, to 10.8c as reported on page 48 of Sept. 7 issue, S. O. reports.

Imperial Oil—Kerosine:
Regina cut 1c, Saskatoon cut 1.5c, Calgary cut 0.5c, June 21.

Fuel Oil

S. O. New Jersey—Nos. 1 and 2:
Columbia cut 0.3c, and Spartanburg cut 0.5c, Sept. 13.

Fuel Oil

(Continued from page 38)

sale markets along the eastern seaboard, according to reports of traders.

Lower prices were reported for No. 1 oil and kerosine at Philadelphia, and there were reports of price shading on Nos. 1 and 2 oils at Boston and New York harbor.

Sellers here looked for a pick up in fuel oil demand in the New York market, with companies along the barge canal laying in supplies before the canal closes around the end of November.

* * *

TULSA, Oct. 3. — Supplies of most grades of light fuel were reported closely held in the Mid-Continent last week. Open spot market demand was light and it was generally indicated that most northern heating oil distributors had arranged for their requirements on contract.

Heavy fuels were sluggish with inventories excessive, refiners said. Demand for road oil this summer had cut their stocks of these oils somewhat, one or two refiners said, but they expected this demand to fall off with the usual seasonal slump in road construction.

Employe Pension Fund

PONCA CITY, Okla., Oct. 1.—Continental Oil Co. announced the establishment of a retirement and pension fund for all its employes, at the age of 65 in the case of men, and 60 in the case of women.

The plan, according to Dan Moran, president of the company, will be cooperative in character, employes making regular monthly contributions which will be supplemented by a contribution by the company. It will provide a minimum benefit of $30 a month, and in the average case the total retirement income, including the federal pension, will amount to a figure somewhere between one-third and one-half of the employe's salary.

For the older employes the company is providing a benefit in recognition of services already rendered.

"The new retirement and pension plan," said Moran, "was adopted by the directors of the company after authorization by the stockholders at the last annual meeting, and it is their opinion that it will benefit both the company and the employes."

The plan affects approximately 5000 employes, and will be administered by the Metropolitan Life Insurance Company.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Oct. 3, 1938

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 4
S. O. NEW JERSEY			
Atlantic City, N. J.	8.0	6.0	6.0
Newark	8.0	6.0	6.0
Annapolis, Md.	....	6.25	....
Baltimore	7.5	6.5	6.0
Washington, D. C.	7.25	6.5	6.5
Norfolk, Va.	7.0	6.0	6.0
Petersburg	7.25	6.25	....
Richmond	7.25	6.25	6.25
Charlotte, N. C.	8.75	7.75	....
Hickory	....	8.25	....
Raleigh	8.75	7.25	....
Charleston, S. C.	8.5	7.0	....
Columbia	9.5	8.0	....
Spartanburg	10.2	8.7	....
SOCONY-VACUUM OIL CO. INC. (S. O. New York Division)			
	No. 2	No. 3	No. 4
New York City	6.50	6.50	6.50
Albany, N. Y.	7.00	7.00	6.50
Rochester, N. Y.	7.50	7.50	7.50
Boston, Mass.	6.00	6.00	6.00
Bangor, Me.	7.0	7.0	7.0
Manchester, N. H.	6.50	6.50	6.50
Burlington, Vt.	8.00	8.00	8.00
Hartford, Conn.	6.00	6.00	6.00
New Haven, Conn.	5.25	5.25	5.25
Providence, R. I.	6.00	6.00	6.00

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING Cont'd				
Philadelphia, Pa.	7.75	6.00	6.00	6.00
Allentown, Pa.	8.50	6.50	6.50	6.50
Wilmington, Del.	7.75	6.00	6.00	6.00
Springfield, Mass.	8.00	6.50	....	6.50
Worcester, Mass.	8.00	6.00	....	6.00
Hartford, Conn.	7.00	6.00	....	6.00
S. O. OHIO				
Columbus Division and Cleveland	7.50	7.50	7.00	....
City of Lima	8.00	8.00	7.00	....
Rest of Ohio	8.00	8.00	7.50	....

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

S. O. INDIANA

Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	(a)6.5	6.5
Indianapolis	...	(b)7.8
Detroit	...	7.1
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	(c)6.7
Kansas City	6.8	6.8

(a) For 400 gals. and over; 150 to 399 gals., 7c; 1 to 149 gals., 8c.
(b) Excluding 4c state tax.
(c) For 400 gals. & over; 100 to 399 gals., 7c; 1 to 99 gals., 8c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Oct. 3	
District:	(a)60-64 Oct.	(a) 65 Oct. & Above
N. Y. harbor	6.00 – 6.75	6.00 – 6.75
(b)N. Y. harbor	5.75 – 6.50	5.75 – 6.50
Philadelphia	6.00 – 6.50	6.00 – 6.50
Baltimore	6.00 – 6.50	6.25 – 6.75
Norfolk	6.50 – 7.00	6.75 – 7.25
Wilmington, N. C.	6.50 – 7.00	6.75 – 7.25
Charleston, S. C.	6.50 – 7.00	6.75 – 7.25
Savannah	6.50 – 7.00	6.50 – 7.25
Jacksonville	6.00 – 7.00	6.50 – 7.25
Portland	7.00 – 7.50	7.00 – 7.50
Boston	6.25 – 7.00	6.50 – 7.00
Providence	6.25 – 7.00	6.50 – 7.00

WATER WHITE KEROSINE

District:			
N. Y. harbor	4.75 –5.00	Charleston	5.00–5.25
(b)N. Y. harbor	4.625–4.875	Savannah	5.00–5.25
Philadelphia	4.75–5.00	Jacksonville	5.00–5.25
Baltimore	5.00–5.25	Portland	5.60
Norfolk	5.00–5.25	Boston	4.75–5.00
Wilmington, N.C.	5.00–5.25	Providence	4.75–5.00

(c)FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	4.75 – 5.00	4.625– 4.875
Nos. 2-3	4.25	4.00 – 4.125
No. 4	4.00 – 4.25	3.875– 4.125
No. 5	(n)$1.15	.....
No. 6	$0.85 –$0.95	.....

	Phila. dist.	Balt. dist.
No. 1	4.75 – 5.00	5.00 – 5.25
Nos. 2-3	4.25	4.25
No. 4	4.00	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

	Bost. dist.	Prov. dist.
No. 1	4.75 – 5.00	4.75 – 5.00
Nos. 2-3	4.10 – 4.25	4.25
No. 4	4.00 – 4.25	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

District:	(d)Bunker C Fuel	(d)Diesel Oil
N. Y. harbor	(f)$0.95	(g)$1.75
Philadelphia	(f)$0.95	(g)$1.75
Baltimore	(f)$0.95	(g)$1.75
Norfolk	(e)$0.95	$1.75
Charleston	$0.90	$1.75
Savannah	(e)$0.90	$1.785
Jacksonville	(e)$0.90	$1.785
Tampa	(e)$0.85	$1.785
Portland	$1.05	$1.85
Boston	(f)$0.95	(g)$1.75
Providence	$0.95	$1.75

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	4.00 – 4.25	4.00 – 4.25
Philadelphia dist.	4.25	....
Baltimore dist.	4.25	....
Norfolk dist.	4.25	....
Savannah dist.	....	4.25
Jacksonville dist.	....	4.25

Pacific Export

(i) (Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Oct. 3	Sept. 26
U. S. Motor, under 65 oct.	4.875– 5.00	4.875– 5.00
400 e.p. blend, under 65 oct.	5.00 – 5.125	5.00 – 5.125
400 e.p. blend 65 oct. & above	5.125– 5.375	5.125– 5.375
(h) 38-40 w.w. kerosine	4.25 – 4.75	4.25 – 4.75
41-43 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.25 – 5.50	5.25 – 5.50
In Cargo lots, per bbl.		
Dieselfuel, 24° & above	$1.05 –$1.20	$1.05 –$1.20
Diesel fuel, under 24°	$0.95 –$1.05	$0.95 –$1.05
(h)30-34 diesel (gas oil)	$1.25 –$1.30	$1.25 –$1.30
(k) Grade C fuel oil	$0.60 –$0.70	$0.55 –$0.70

Prices Effective	Oct. 3	Sept. 26
In Ships' Bunkers, or deep tank lots, per bbl.:		
(j)Diesel fuel oil	$1.525–$1.55	$1.525–$1.55
(k)Grade C fuel oil	$0.70 –$0.90	$0.70 –$0.90
Cased Goods: (Per case)		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, under 65 octane	$1.50 –$1.60	$1.50 –$1.60
375–400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
(h)40-43 w.w. kerosine	$1.30 –$1.40	$1.30 –$1.40
Kerosine, p.w.	$1.25 –$1.35	$1.25 –$1.35

New York Export

(Cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	21.50	21.50
Neutral oil:		
200 3 color, 25 p.t.	22.50	22.50
150 3 color, 25 p.t.	21.50	21.50
600 s.r., unfiltered	15.50 –16.50	15.50 –16.50
650 s.r., unfiltered	17.50 –18.50	17.50 –18.50
600 fl., s.r.	18.00 –19.00	18.00 –19.00
630 fl., s.r.	20.50 –21.50	20.50 –21.50

Wax, Domestic *and* Export

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, f.a.s., carloads. Domestic prices, f.o.b. refineries in New Orleans & New York districts in bags, carloads, with 0.2c discount allowed for shipment in bulk, except where noted below. Scale solid; fully refined, slabs in bags)

Prices Effective	Oct. 3	
	New York	
	Domestic	Export
124-6 Y.C. scale	2.35 – 2.50	2.35 – 2.50
122-4 W.C. scale	2.35 – 2.50	2.35 – 2.50
124-6 W.C. scale	2.35 – 2.50	2.35 – 2.50
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625
135-7 Fully rfd.	(l)4.90	5.00 – 5.125
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	2.35 – 2.50	2.35 – 2.50
122-4 W.C. scale	2.35 – 2.50	2.35 – 2.50
124-6 W.C. scale	2.35 – 2.50	2.35 – 2.50
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625

Gulf Coast

(F.o.b. ship, Gulf oil terminals; minimum 20,000 bbls.; representing traders' opinions)

Prices Effective	Oct. 3	Sept. 26
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	4.625– 4.75	4.625– 4.875
60-64 oct.	4.625– 4.875	4.75 – 5.00
65-67 octane	4.875– 5.125	4.875– 5.125
68-70 octane	5.125– 5.50	5.125– 5.50
FUEL OILS		
No. 1	3.75 – 4.00	3.75 – 4.00
No. 2	3.50	3.50
KEROSINE		
41-43 w.w.	4.00	4.00
For Export Shipment:		
GASOLINE		
U. S. Motor	4.625– 4.75	4.625– 4.75
60-62, 400 e.p.	4.625– 4.75	4.625– 4.75
61-63, 390 e.p.	4.625– 5.00	4.625– 5.00
64-66, 375 e.p.	4.625– 5.00	4.625– 5.00
KEROSINE		
44 w.w.	(a) 4.25 –4.50	(a) 4.25 –4.50
41-43 w.w.	4.00	4.00
41-43 p.w.	4.00	4.00

Prices Effective	Oct. 3	Sept. 26
GAS AND BUNKER OILS		
For Export Shipment		
Gas Oil (m):		
Below 43 diesel index	3.50	3.50
43-47 diesel index	3.50 – 3.625	3.50 – 3.625
48-52 diesel index	(a) 3.50 –3.625	(a) 3.50 –3.625
53-57 diesel index	(a) 3.625–3.75	(a) 3.625–3.75
For Domestic and /or Export Shipment		
Diesel Oil Ship's bkrs.	(o)$1.55	(o)$1.55
Grade C bunker oil for ship's bunkers	(o)$0.75	(o)$0.75
Grade C bunker oil, in cargoes	$0.60 –$0.65	$0.60 –$0.65

MID-CONTINENT LUBRICATING OILS

(Cents per gal. at Gulf; in bbls., f.a.s.; in bulk, f.o.b. terminals)

	Oct. 3	
	(p)Barrels	Bulk
190-200 vis. D. 210 brt. stock	22.50 –24.50	17.60 –17.75
150-160 vis. D 210 brt. stock:		
0-10 p.p.	19.00 –20.50	13.00 –14.75
10-25 p.p.	18.50 –20.00	12.50 –14.25
150-160 vis. E 210 brt. stock	18.50 –20.00	13.00 –14.50
120 vis. D 210 brt. stock	18.50 –20.00	13.00 –14.50

	Oct. 3	Sept. 26
180 vis. No. 3 color neutral:	Bulk	Bulk
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
200 vis. No. 3 color neutral:		
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
600 s.r. olive green	9.00 –11.25	9.00 –11.25
600 s.r. dark green	7.00 – 9.25	7.00 – 9.25

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° cold test 0, bulk export shipment, f.o.b. terminals.)

Unfiltered Pale Oils:

Vis. Color		
100 No. 3	4.75 – 5.00	4.75 – 5.00
200 No. 3	6.25 – 6.75	6.25 – 6.75
300 No. 3	6.75 – 7.25	6.75 – 7.25
500 No. 3½	7.50 – 8.25	7.75 – 8.25
750 No. 4	8.25 – 8.75	8.25 – 8.75
1200 No. 4	8.75 – 9.25	8.75 – 9.25
2000 No. 4	9.00 – 9.50	9.00 – 9.50

Red Oils:

Vis. Color		
100 No. 5-6	4.75 – 5.00	4.75 – 5.00
200 No. 5-6	6.25 – 6.75	6.25 – 6.75
300 No. 5-6	6.75 – 7.25	6.75 – 7.25
500 No. 5-6	7.50 – 8.25	7.75 – 8.25
750 No. 5-6	8.25 – 8.75	8.25 – 8.75
1200 No. 5-6	8.75 – 9.25	8.75 – 9.25
2000 No. 5-6	9.00 – 9.50	9.00 – 9.50

Note: Red oil prices cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates to Continental ports, shillings per ton of 2240 lbs., British sterling; U. S. ports cents per bbl.)

Rates Effective Oct. 3

	Crude & /or Fuel		Refined Oil & /or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.(q)	12/	12/-13/6	12/	12/6-14/
Aruba-U.K./Cont.(q)	10/	10/-11/6	10/	10/6-12/
Gulf-N. Atlantic (r) (not E. of N.Y.):				
Hvy. Crude & fuel, (10 to 19.9 gravity)	17.5c	19c	....	....
Light Crude, (30 Grav. or Lighter)	14c	14c-15c	....	....
Gasoline	....	....	16c	16-17c
Kerosine	....	....	16c	16-17c
Light Fuel	....	....	16c	17-18c

(a) Prices nominal. (b) In barge lots. (c) Fuel oils meet specifications of U. S. Commercial Standards CS12-35. (d) In ships' bunkers. (e) For barging, add 5c per bbl. (f) For barging, add 5c to 6c per bbl. (g) For barging, add 6.5c to 7.5c per bbl. (h) 150 fire point. (i) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (j) Pacific Specification 200. (k) Pacific Specification 400. (l) Shipment either in bags or in bulk. (m) Less than ½ of 1% sulfur. (n) No prices reported. (o) Barging 5c per bbl. additional at some Gulf ports. (p) Second-hand barrels. (q) Continental ports in range between Bordeaux and Hamburg, both inclusive. (r) Venezuela loading, same rate; Tampico, 2c to 3c per bbl. additional. (s) Low pour test, low viscosity, No. 5 generally quoted at $1.25.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective Sept. 1, 1938, except Corning Sept. 3, 1938)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.34
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.28
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.18
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.07

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective Sept. 1, 1938).....$1.68
*The Pennzoil Co.: (Effective Sept. 1, 1938)
Penna. Grade Oil in National Transit Lines*$1.61
*The Pennzoil Co. posts $1.61 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $1.56 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (Jan. 5, 1938)....$1.12

Posted by Simrall Corp.

(Effective Oct. 1, 1938)

Allegan, Crystal, Greendale, Porter and equal grades.....$1.025
Beaverton, Buckeye, Bentley, Edenville and Freeman.....$1.00
West Branch, Arenac, and equal grades.....$0.84

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Sept. 27, 1938)

Illinois, Illinois Basin, Princeton.....$1.25
Owensboro, (Western Ky.).....$1.20

(Effective Nov. 20, 1937)

Lima, O.....$1.00

Posted by Owensboro Corp.

Illinois:
Beecher City (Effective Sept. 27, 1938)....$1.25
Centralia Field:
Congested District (Effective Oct. 1, 1938) .$1.15
Area Outside Congested District (Effective May 25, 1938).....$1.25

Posted by Carter Oil Co.

(Effective Sept. 29, 1938)

Louden, Fayette County, Ill.....$1.25

Posted by Ashland Oil & Transportation Co.

(Effective Oct. 1, 1938)

Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River.....$1.22
Kentucky River.....$1.30

Posted by Stoll Oil Refining Co.

(Effective Sept. 10, 1938)

Stoll Pipe Line Oil (Ky.).....$1.20

Posted by Fordsville Gathering Line, Inc.

(Effective Sept. 27, 1938)

Birk City Field, Ky.....$1.20
Owensboro District, Ky.....1.20

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Jan. 5, 1938)

Crude Oil

40-40.9°	$1.14	53-53.9	$1.40
41-41.9	1.16	54-54.9	1.42
42-42.9	1.18	55-55.9	1.44
43-43.9	1.20	56-56.9	1.46
44-44.9	1.22	57-57.9	1.48
45-45.9	1.24	58-58.9	1.50
46-46.9	1.26	59-59.9	1.52
47-47.9	1.28	60-60.9	1.54
48-48.9	1.30	61-61.9	1.56
49-49.9	1.32	62-62.9	1.58
50-50.9	1.34	63-63.9	1.60
51-51.9	1.36	64-64.9	1.62
52-52.9	1.38		

Crude Naphtha, 65 grav. & above.....$2.14

Absorption Gasoline

90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec., 17 lb. Reid v.p.....$2.08

†MID-CONTINENT

(Effective Jan. 28, 1937)

	(In Oklahoma- *Kansas)	(In North-North Central Texas)
Below 29	$1.06	$0.96
29-29.9	1.08	0.98
30-30.9	1.10	1.00
31-31.9	1.12	1.02
32-32.9	1.14	1.04
33-33.9	1.16	1.06
34-34.9	1.18	1.08
35-35.9	1.20	1.10
36-36.9	1.22	1.12
37-37.9	1.24	1.14
38-38.9	1.26	1.16
39-39.9	1.28	1.18
40 & above	1.30	1.20

†Prices posted by Standard Oil Co. (Indiana) in Okla.-Kans., and in Texas by Stanolind Oil Purchasing Co.

Above prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Effective June 16, 1938, Kanotex Refg. Co. posted Okla.-Kans. crude, 34 & below, at $1.03, 35-35.9 at $1.05, plus 2c differential to 40 & above, at $1.15.

Effective Sept. 1, 1938, Rock Island Oil Co. cut southern Okla. crude, in Stephens, Carter and Garvin counties, 10c, posting 20-20.9 at $0.65, plus 4c differential to 25-25.9 inclusive; from 26-26.9 to 30-30.9 inclusive, 3c differential; and from 31-31.9 to 40 and above, 2c differential, with 40 & above being $1.20.

Note: S. O. Indiana prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 100% tank tables are used effective Oct. 1, 1937, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.

In Oklahoma

(Effective Jan. 28, 1937)

Below 25	$0.98	33-33.9	$1.16
25-25.9	1.00	34-34.9	1.18
26-26.9	1.02	35-35.9	1.20
27-27.9	1.04	36-36.9	1.22
28-28.9	1.06	37-37.9	1.24
29-29.9	1.08	38-38.9	1.26
30-30.9	1.10	39-39.9	1.28
31-31.9	1.12	40 and above...	1.30
32-32.9	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Barnsdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

	Jefferson County, Texas Beaumont (Magnolia) (Oct. 1, 1937)	West Beaumont (Humble) (May 1, 1938)
Below 21°	$0.95	$0.95
21-21.9	0.98	0.98
22-22.9	1.01	1.01
23-23.9	1.04	1.04
24-24.9	1.07	1.07
25-25.9	1.10	1.10
26-26.9	1.13	1.13
27-27.9	1.15	1.15
28-28.9	1.17	1.17
29-29.9	1.19	1.19
30-30.9	1.21	1.21
31-31.9	1.23	1.23
32-32.9	1.25	1.25
33-33.9	1.27	1.27
34-34.9	1.29	1.29
35-35.9	for	1.31
36-36.9	oil	1.33
37-37.9	34 & above	1.35
38-38.9		1.37
39-39.9		1.39
40 & above		1.41

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

(*West Central Texas)

(Effective Sept. 19, 1938)

28-28.9	$0.96	35-35.9	$1.10
29-29.9	0.98	36-36.9	1.12
30-30.9	1.00	37-37.9	1.14
31-31.9	1.02	38-38.9	1.16
32-32.9	1.04	39-39.9	1.18
33-33.9	1.06	40 & above	1.20
34-34.9	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

**East Central Texas*

(Effective Jan. 28, 1937)

Below 29	$1.03	35-35.9	$1.17
29-29.9	1.05	36-36.9	1.19
30-30.9	1.07	37-37.9	1.21
31-31.9	1.09	38-38.9	1.23
32-32.9	1.11	39-39.9	1.25
33-33.9	1.13	40 and above...	1.27
34-34.9	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

	Gray County	Carson-Hutchinson
	(Effective Sept. 19, 1938)	
34-34.9	$0.96	$0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 & above	1.08	1.03

EAST TEXAS

(Effective *Aug. 29-30-Sept. 1, 1938)

Gulf, Humble, Magnolia, Shell, Sinclair-Prairie, Stanolind, Sun, Texas Co., Tide-Water Associated.....$1.25

*Effective Aug. 29 by Gulf, Humble, Shell, Stanolind; Aug. 30 by Sinclair-Prairie, Texas, Tide Water; Sept. 1, Magnolia and Sun.

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex.:
Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company

(Posted by The Texas Co., Jan. 28, 1937)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, *Gaines, Glasscock, Howard, *Reagan, Upton, Winkler and *Yoakum Counties, Texas and Lea county, New Mexico).

Below 26	$0.78	33-33.9	$0.94
26-26.9	0.80	34-34.9	0.96
27-27.9	0.82	35-35.9	0.98
28-28.9	0.84	36-36.9	1.00
29-29.9	0.86	37-37.9	1.02
30-30.9	0.88	38-38.9	1.04
31-31.9	0.90	39-39.9	1.06
32-32.9	0.92	40 & above	1.08

Pecos, West Texas.....$0.91

*Added to this posting, Aug. 29, 1938.

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winkler.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil Purchasing Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M. except that its top grade is 36 and above, at $1.00.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co.)

(Effective Jan. 28, 1937)

Ft. Collins and Wellington

Below 29	$1.01	35-35.9	$1.15
29-29.9	1.03	36-36.9	1.17
30-30.9	1.05	37-37.9	1.19
31-31.9	1.07	38-38.9	1.21
32-32.9	1.09	39-39.9	1.23
33-33.9	1.11	40 & above	1.25
34-34.9	1.13		

Canon City and Florence, Col.....$1.10

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields.....$1.09
Van Zandt.....$1.10

(Effective Aug. 29, 1938)

Flour Bluff.....$1.40
Pettus.....1.42

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, and $1.15 in Hardin, both in Liberty county, Tex. Effective July 11, 1938, Sun Oil Co. posted $1.15 for Hardin.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Anahuac, Cedar Point, Dickinson, Gillock, Fairbanks, and Turtlebay

(Effective Sept. 19, 1938)

27-27.9	$1.10	34-34.9	$1.24
28-28.9	1.12	35-35.9	1.26
29-29.9	1.14	36-36.9	1.28
30-30.9	1.16	37-37.9	1.30
31-31.9	1.18	38-38.9	1.32
32-32.9	1.20	39-39.9	1.34
33-33.9	1.22	40 & above	1.36

Conroe, Raccoon Bend (Deep sand crude) Tomball and Satsuma

(Effective Sept. 19, 1938)

28-28.9	$1.20	35-35.9	$1.34
29-29.9	1.22	36-36.9	1.36
30-30.9	1.24	37-37.9	1.38
31-31.9	1.26	38-38.9	1.40
32-32.9	1.28	39-39.9	1.42
33-33.9	1.30	40 & above	1.44
34-34.9	1.32		

Jefferson County, Tex.

West Beaumont, see prices under Magnolia in center column.

(*Continued on next page*)

CRUDE OIL MARKETS

(Continued from preceding page)

South-Southwest Texas (cont'd)

Posted by Humble

***Mirando**

(Effective Aug. 29, 1938)

20-20.9	$0.96	36-36.9	$1.28
21-21.9	0.98	37-37.9	1.30
22-22.9	1.00	38-38.9	1.32
23-23.9	1.02	39-39.9	1.34
24-24.9	1.04	40-40.9	1.36
25-25.9	1.06	41-41.9	1.38
26-26.9	1.08	42-42.9	1.40
27-27.9	1.10	43-43.9	1.42
28-28.9	1.12	44-44.9	1.44
29-29.9	1.14	45-45.9	1.46
30-30.9	1.16	46-46.9	1.48
31-31.9	1.18	47-47.9	1.50
32-32.9	1.20	48-48.9	1.52
33-33.9	1.22	49-49.9	1.54
34-34.9	1.24	50 & above	1.56
35-35.9	1.26		

*Includes Duval, Jim Hogg, Jim Wells, Webb and Zapata counties, Tex. and Heyser and Placedo crudes.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Jan. 28, 1937)

	*N. La.-Ark.	Rodessa, La.	Roanoke & N. Crowley, S. La. (Dec. 28, '37)	†Columbia County, Ark. (July 7, 1938)
Below 21°	$0.90	$0.93	$0.90	$0.83
21-21.9	for	for	.93	for
22-22.9	oil	oil	.96	oil
23-23.9	Below	Below	.99	Below
24-24.9	25°	25°	1.02	25°
25-25.9	$0.92	$0.95	1.05	$0.85
26-26.9	.94	.97	1.08	.87
27-27.9	.96	.99	1.10	.89
28-28.9	.98	1.01	1.12	.91
29-29.9	1.00	1.03	1.14	.93
30-30.9	1.02	1.05	1.16	.95
31-31.9	1.04	1.07	1.18	.97
32-32.9	1.06	1.09	1.20	.99
33-33.9	1.08	1.11	1.22	1.01
34-34.9	1.10	1.13	1.24	1.03
35-35.9	1.12	1.15	1.26	1.05
36-36.9	1.14	1.17	1.28	1.07
37-37.9	1.16	1.19	1.30	1.09
38-38.9	1.18	1.21	1.32	1.11
39-39.9	1.20	1.23	1.34	1.13
40 & above	1.22	1.25	1.36	1.15

(Effective Sept. 15, 1938)

Smackover, Ark.	$0.75
Urania, La. (Ark. Fuel Oil Co., Jan. 28 '37)	$1.02

*Includes Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie and Miller county.

†Includes Buckner, Magnolia, and Village pools.

(Posted by Continental Oil Co.)

*Tepetate, *Abbeville and *Ville Platte, La. $1.24

*Tepetate effective Jan. 28, 1937; Abbeville and Ville Platte, June 1, 1938.

Jan. 28, 1937, Magnolia posted in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., Eldorado and Rainbow districts, Ark. same price and gravity schedule as S. O. La. posts in N. La.-Ark. fields; and met S. O. La's. Rodessa and Smackover prices.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. It posts $0.75 for Smackover, effective Sept. 16, 1938.

***GULF COASTAL FIELDS**

Posted by Humble Oil & Refining Co. and The Texas Co.

	(Effective Jan. 28, 1937 Humble	Texas	†Refugio Saxet, etc. (Humble) (Aug. 29,'38)
Below 18..	$0.95	*$0.95	....
18-18.9....	for	for	....
19-19.9....	below	below	....
20-20.9....	21°	21°	$1.01
21-21.9....	0.98	0.98	1.03
22-22.9....	1.01	1.01	1.05
23-23.9....	1.04	1.04	1.07
24-24.9....	1.07	1.07	1.09
25-25.9....	1.10	1.10	1.11
26-26.9....	1.13	1.13	1.13
27-27.9....	1.15	1.15	1.15
28-28.9....	1.17	1.17	1.17
29-29.9....	1.19	1.19	1.19
30-30.9....	1.21	1.21	1.21
31-31.9....	1.23	1.23	1.23
32-32.9....	1.25	1.25	1.25
33-33.9....	1.27	1.27	1.27
34-34.9....	1.29	1.29	1.29
35-35.9....	1.31	for	1.31
36-36.9....	1.33	oil	1.33
37-37.9....	1.35	34°	1.35
38-38.9....	1.37	and	1.37
39-39.9....	1.39	above.	1.39
40-40.9....	1.41	....	1.41
41-41.9....	for	....	1.43
42-42.9....	oil	....	1.45
43-43.9....	40°	....	1.47
44-44.9....	and	....	1.49
45-45.9....	above.	....	1.51
46-46.9....	....	....	1.53
47-47.9....	....	....	1.55
48-48.9....	....	....	1.57
49-49.9....	....	....	1.59
50 & above.	....	....	1.61

†Includes also Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor crudes.

*Humble's prices apply in these Texas fields: Amelia, Barbers Hill, Clear Lake (beginning Aug. 29, 1938), Clinton, Goose Creek, Hull, Liberty, Mykawa, Orange, Pierce Junction, Raccoon Bend, (shallow sand), Sugarland, Thompsons, Webster, (beginning Aug. 29, 1938), and West Columbia. Same prices also apply, effective Feb. 1, 1938, in Clinton, Tex., posted by Stanolind.

Jan. 28, Sinclair-Prairie met above Humble schedule in full

‡$0.95 for oil below 21° posted April 1, 1938.

July 6, 1937, The Texas Co. posted for Refugio, which includes Greta, Saxet and Taft: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

Texas Co. postings in Gulf Coastal Texas include: Arriola, Five Corners, Ganado, Humble, Liberty, Magnet, Manvel, Markham, Mauriceville, McFaddin, Pickett Ridge, Port Neches, Sour Lake, West Columbia and Withers. In Gulf Coastal Louisiana: Bay St. Elaine, Caillou Island, Dog Lake, Four Isle, Gillis, Horseshoe Bayou, Iberia, Lake Barre, Lake Pelto, Leesville and Port Barre.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

(Effective Jan. 6, 1938)

Tensleep, Salt Creek field	$0.70

(Effective Jan. 28, 1937)

Greybull-Torchlight	$1 30
Iles, light, Col.	1 18
Iles, heavy	1 12
Hogback, N. M.	1 33
Big Muddy	1.23

(Effective July 8, 1938)

Elk Basin, light	$1 05
Grass Creek, light	1.05

(Effective May 1, 1938)

Frannie light	$0 65
Grass Creek, heavy	0 50
Hamilton Dome, Wyo.	0.45

(Effective Nov. 4, 1936)

Frannie heavy	$0.62

Posted by Ohio Oil Co.

(Effective July 8, 1938)

Elk Basin, Wyo.	$1 05
Grass Creek, light	1.05

(Effective Jan. 28, 1937)

Rock Creek	1 205
Lance Creek	0.97

(Effective May 1, 1938)

Grass Creek heavy	$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.

(Effective Jan. 1, 1938)

Cat Creek, Mont.	$1.30

(Effective Jan. 28, 1937)

Big Muddy, Wyo.	$1 18
Lance Creek, Wyo.	0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Santa Maria Valley, by Union Oil, May 20, 1938.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hill-	Coalinga	Wheeler Ridge	Santa Maria (Union Oil)
13-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	$0.40
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76	....	....	$0.80	$0.76	$0.76	$0.77	$0.78	....	$0.70	....	$0.70	$0.70	....	$0 70	$0.70	....	.42
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	70	.70	....	.44
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.45
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.46
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.47
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	....	.74	.71	.70	.48
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	....	.78	.72	.70	....
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	....	.82	.74	.70	....
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	....	.86	.78	.72	....
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	....	.90	.82	.76	....
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	....	.94	.86	.79	....
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	....	.98	.90	.83	....
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	....	1.02	....	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1 10	1.10	$0.91	1.06	....	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	.94	1.10	....	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	Pipe	1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	.98	1.14	....	....	....
30-30.9	1.21	1.19	.95	1.22	1.21		1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	1.02	1.18	....	....	....
31-31.9				....	1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	1.06				....
32-32.9		*Elwood Terrace		....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.09	Kettleman Hills			....
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.13	....	1.19	....	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	1 17	....	1 23	....	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	1.20	....	1.27	....	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	1.24	....	1.31	....	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	1.28	....	1 35	....	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	1.31	....	1.39	....	....
39-39.9	....	....	....	....	....		....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	1.35	....	1.43	....	....
40-40.9	....	....	....	....	....	F. O. B. Standard Pipe Line	....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	1.39	....	....	....	....
41-41.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	....	....
42-42.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.46	....	....	....	....
43-43.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.50	....	....	....	....
44-44.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.54	....	....	....	....
45-45.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.57	....	....	....	....
46-46.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.61	....	....	....	....
47-47.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.65	....	....	....	....
48-48.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.68	....	....	....	....

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Coming Meetings

Liquefied Petroleum Gas Assn., Eastern Section, Atlantic City, N. J., 1 day week of Oct. 10.

Montana National Bituminous Conference, sponsored by Western Petr. Refiners Assn. and Mont. and Miss. highway departments, Edgewater Gulf Hotel, Biloxi, Miss., Oct. 10 to 13.

American Gas Assn., Atlantic City, N. J., Oct. 10 to 14.

National Safety Congress, Petroleum Section, Hotel Stevens, Chicago, Ill., Oct. 10 to 14.

North American Gasoline Tax Conference, Tulsa, Oct. 10 to 14.

Indiana Independent Petroleum Assn., Fall convention, Hotel Severin, Indianapolis, Ind., Oct. 12 and 13.

Mid-Continent Oil & Gas Assn., La.-Ark. Division, annual membership and annual meeting of executive committee, Shreveport, La., Oct. 14.

National Stripper Well Assn., and Oklahoma Stripper Well Assn., annual meetings, Tulsa, Okla., Oct. 18.

Independent Petroleum Assn. of America, Tulsa, Okla., Oct. 19, 20 and 21.

American Inst. of Mining & Metallurgical Engineers, Petroleum Division, Los Angeles, Oct. 20, 21.

National Assn. of Credit Men, Petroleum Refiners Division, Indianapolis, Athletic Club, Indianapolis, Ind., Oct. 24, 25, 26.

National Oil Marketers Assn., Morrison Hotel, Chicago, Oct. 24, 25.

National Tax Conference, Hotel Statler, Detroit, Oct. 24 to 28.

National Petroleum Assn., Dept. of Fire & Accident Prevention, Semi-Annual Meeting, Olean, N. Y., Oct. 26.

National Battery Manufacturers Assn., 14th annual convention, Hotel Sherman, Chicago, Oct. 27, 28.

Mid-Continent Oil & Gas Assn., Texas Division, San Antonio, Tex., Oct. 27, 28, 29.

Western Petroleum Refiners Assn., Technical Group Meeting, Washington-Youree Hotel, Shreveport, La., Oct. 28.

American Trucking Assns., Inc., 5th annual convention, Detroit, Oct. 31-Nov. 2.

Oil Trades Assn. of New York, annual banquet, Waldorf-Astoria Hotel, New York, Nov. 1.

American Institute of Mining and Metallurgical Engineers, regional meeting, Tucson, Ariz., Nov. 1 to 5.

American Assn. of Petroleum Geologists, Pacific Section, Los Angeles, Calif., Nov. 3, 4.

Society of Automotive Engineers, West Coast regional transportation-maintenance meeting, Elks Club, Los Angeles, Nov. 3, 4 and 5.

Mid-Continent Oil & Gas Assn., Kansas-Okla. Division annual meeting, Tulsa, Nov. 4.

National Automobile Show, Grand Central Palace, New York, Nov. 11 to 18.

National Motor Truck Show, Port of New York Authority Bldg., New York, Nov. 11 to 18.

Society of Automotive Engineers, annual dinner, Commodore Hotel, New York, N. Y., Nov. 14.

American Petroleum Institute, 19th annual meeting, Stevens Hotel, Chicago, Ill., Nov. 14 to 18.

American Society of Mechanical Engineers, annual meeting, New York, N. Y., Dec. 5 to 9.

Exposition of Chemical Industries, Grand Central Palace, New York, Dec. 4 to 9.

Nebraska Petroleum Marketers, Inc., Omaha, Nebr., Dec. 6 to 8.

Oil & Gas Assn. of Michigan, annual meeting, Mt. Pleasant, Mich., Dec. 7.

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Society of Automotive Engineers, annual meeting, Detroit, Mich., Jan. 9 to 13.

Missouri Independent Oil Jobbers Assn., annual meeting and trade exhibit, De Soto Hotel, St. Louis, Jan. 18, 19.

Northwest Petroleum Assn. (Minnesota Division), Lowry Hotel, St. Paul, Minn., Jan. 26 and 27.

Kentucky Petroleum Marketers Assn., 13th annual meeting, Brown Hotel, Louisville, Feb. 7, 8.

Twelfth National Asphalt Conference, Los Angeles, week of Feb. 27.

Iowa Independent Oil Jobbers Assn., Des Moines, Ia., March 7, 8, 9.

Oil-World Exposition, Houston, Tex., April 24 to 29.

Pennsylvania Grade Crude Oil Assn., annual meeting, Hotel Hershey, Hershey, Pa., June 15, 16.

13th International Congress of Carbide, Acetylene, Oxy-Acetylene Welding & Allied Industries, Munich, Germany, June 25 to July 1.

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Blakeslee's experience in the oil business started back in 1911, in California. In 1917 he joined the Associated Oil Co. of California and soon was put at the head of its safety work. He has been in charge of the work of the petroleum section of the Safety Council for several years.